CLINICAL MANUAL

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CLINICAL MANUAL

COMPILED FOR THE USE OF STUDENTS

IN THE

MADRAS MEDICAL COLLEGE.

BY

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SECOND EDITION.

MADRAS:
HIGGINBOTHAM AND CO.
By Appointment in India to His Royal Highness the Prince of Wales,
and to the Madras University.
1883.

MADRAS:
PRINTED BY HIGGINBOTHAM & CO
165, MOUNT ROAD

PREFACE.

In the year 1878 a small book was compiled by Surgeon A. M. **Branfoot**, M.B. with the assistance of the other members of the Hospital Staff, containing the formulæ in use in the General Hospital. All the copies of this work having been sold in 1880, at the suggestion of several brother-officers and with the assistance of Surgeon C. J. **MacNally**, M.D. I commenced its revision for another edition.

Several new formulæ, copies of the hospital rules regarding the dispensing of medicines and the distribution of diets, were included. I also added some directions regarding the Clinical examination of patients, and other matter, from notes made at different times while I have acted as a Clinical teacher. The Surgeon-General with the Government of Madras thanked me officially for the preparation of the work, and suggested to the Revenue Board that it should be supplied to the Civil Dispensaries throughout the Presidency, this has been done to a considerable extent.

In the present edition a great deal of new matter has been added with the hope of making it a more complete and practical Hospital Manual. In compiling it the source of the information has been given as fully as possible, but there must be many omissions as it is not always easy to say from whence a particular idea has been acquired.

I take this opportunity of thanking several of my brother-officers for many valuable suggestions and much assistance, particularly Surgeon-Major R. W. Cockerill, Professor of Surgery, for revising the chapter on taking Surgical cases; Surgeon Major E. F. Drake-Brockman, F.R.C.S., Professor of Ophthalmology, and Surgeon A. M. Branfoot, M.B., Professor of Midwifery, for the kind manner in which they acceded to my request to contribute a chapter on the Clinical aspects of their own subjects; Surgeon J. Maitland, M.B. for his useful chapter on the antiseptic method of Surgical Dressing and for much willing help in correcting the proofs, and Surgeon Youngerman for checking some of the calculations.

The illustrations have been well copied by Mr. Paczensky, of the Mount Road, Madras.

C. SIBTHORPE, F.K.Q.C.P.,
Surgeon-Major, I.M.D.

Fort St. George,
Madras, *January* 1883.

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ERRATA.

Page	49			In the Nomenclature of diets for Natives, *omit* 'Full with coffee.'
,,	55	Line	2	From top *read* '60° F.' instead of '68° F.'
,,	95			Parasitic diseases *correct* '*Tinea favosa* due to *achorion Schönleinii. Tenia kerion* due to *microsporon furfur. Tenia Sycosis* due to *microsporon mentagraphytes.*'
,,	106	,,	17	From top *omit* the word 'other' before 'narcotics.'
,,	114	,,	20	*Omit* the word 'no' before 'loss of reflex action.'
,,	115	,,	14	Instead of 'about the second teething,' *read* 'between the ages of six months and two years, at the time of the first dentition more especially, and it is the grand source of shrivelled, half dead limbs, club feet, and other sad deformities.' (C. T. Radcliffe, M. D., A System of Medicine by Russe Reynolds, Vol. II.)
,,	117	,,	14	From top *read* 'them' instead of 'than.'
,,	145	,,	21	,, ,, ,, 'tilting' ,, of 'titling.'
,,	147	,,	2	From below *read* 'drab' instead of 'drap.'
,,	148	,,	13	From above ,, ,, ,, ,,
,,	150	,,	10	From below *read* 'their exterior' instead of 'this exteriors.'
,,	156	,,	2	From below *read* 'set up the same' instead of 'the same set up.'
,,	161	,,	5	From top *omit* the word 'even,' before enoug to solidify

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PART I.

RULES REGARDING THE COMPOUNDING AND DISPENSING OF MEDICINES.

HOSPITAL RULES, SECTION IV.

(*a*). The Hospital Assistants are held responsible for the accurate and neat preparation of all medicines, and for their being distinctly labelled before being sent out of the compounding-room.—*Sub-Sect. IV, paras.* 1 & 4.

(*b*). Each nursing block or ward will be provided with a prescription book in which all prescriptions and orders for the medical treatment of the patients are to be entered. These books are to be kept in the ward by the Nurse in charge, who will keep them under lock and key; they are only to be sent to the dispensary when any medicine has been prescribed, and are to be returned at once to the wards. These books are to be divided according to the numbers over the beds, and one set of pages used for each bed. All medicines to the wards are to be sent labelled with the patient's name, number, and ward, and are to be arranged in baskets marked with the name of the ward. One of the dispensary coolies or a bearer will go round at 6-30 A.M. and 4-30 P.M. to collect such bottles, &c., as require replenishing or are empty. Breakages and losses must be reported to the Hospital Assistants, who will bring them to the notice of the Senior Apothecary. The medicines will be sent to the wards at 11-30 A.M. and 6-15 P.M. The Nurses and Ward Attendants are responsible for all bottles, phials, &c., left in the wards. Whenever more than one day's medicine has been ordered for a patient, the bottle is not to be returned from the ward until it requires replenishing.—*Sub-Sect.* II, *para.* 14.

(*c*). The hour of despatch of medicines is to be marked by the Hospital Assistant on a ticket attached to each medicine basket and the hour of receipt by the Nurse of the ward.—*Sub-Sect. IV, para.* 7.

(*d*). Medicines ordered at night are prepared by the Assistant Clinical Clerks on duty, under the supervision of the Apothecary on duty.—*Sub-Sect. IV, para.* 7.

(*e*). The person by whom any prescription is made up will initial the prescription book or paper.—*Sub-Sect. IV, para.* 10.

(*f*). All solid medicines should be entered in grains, ounces, and pounds, and all liquid ones in minims, drachms, ounces, and pints.

Directions to be observed in the use of the Ward Book.

Sub-Section VI.

(*a*). When a patient is admitted to a ward, the date and his name are to be written on the page belonging to the bed he occupies.

(*b*). The prescriptions are to be entered neatly, and the number of doses required mentioned at the foot. The directions should invariably be entered in English.

(*c*). Except in the case of an alteration being made in the medicine or more being required, no further entry is necessary. If an alteration is made, the date and medicine must be again written and the previous medicine cancelled by a single line being drawn through the centre of the page. If more medicine is required, the date and number of doses required should be mentioned.

(*d*). In prescribing medicines, the whole quantity of the medicine is to be stated, and the doses should be divided by the prescriber himself thus :—

℞ Mist. Pectoralis ℥ iii. ℥ i. three times a day.

(*e*). Medicines directed to be given thrice daily are to be given as follows. The first dose at 12 noon, the second dose at 5 P.M., and the third dose at 6-30 A.M. the following morning.

(*f*). When medicines are ordered twice daily, they are to be given at 12 noon and 5 P.M.; when it is wished to give medicines at other periods, the number of hours' interval between each dose and the number of times the dose is to be repeated must be stated in the directions for use, as every second, third, or fourth hour as the case may be.

(*g*). No medicine is to be given to an In-patient without an entry being made in the ward book on the appropriate page. Evening or night prescriptions must have those words written after the date.

(*h*). When a patient is discharged or dies, an entry of the date is to be made and all prescriptions cancelled by passing an ink line down the page.

(*i*). The Ward Nurse is responsible that no delay occurs in sending the medicine bottles and ward book to the dispensary immediately after the visit of the Medical Officer, and the Hospital Assistant on duty at the dispensary will see that the book is returned to the ward with the medicines and that it is not kept longer in the dispensary than is necessary for writing out the hospital fair prescription book.

(*j*). Medicines urgently required while the Medical Officer is going round may be obtained by sending down a prescription to the dispensary signed by the Medical Officer or Apothecary, but such prescription must also be entered in the ward book and the word "supplied" written across it for the information of the compounder.

Rules for Dispensing in Out-patient Department.

Sub-Section VII.

(*a*). A separate record is to be kept by the Hospital Assistant of all medicines used in the Out-patient Department.

(*b*). Stock medicines should be used as much as possible.

(*c*). No poison or expensive drug is to be used in this department without a special order from one of the Medical Officers or the Senior Apothecary.

(*d*). All medicines made up are to be labelled and numbered to correspond with the tickets, and the patient directed to bring the label back when he returns.

(*e*). Each patient should fetch a bottle or other vessel; if he does not do so, a vessel may be given on the order of the Senior Apothecary. No patient is to be sent away without the medicine prescribed.

(*f*). The person who compounds the medicine is to initial the ticket.

List of Stock Medicines to be kept made up.

Name of Medicine.	In-patients' Dispensary.	Out-patients' Dispensary.
Lotio Acidi Carbolici ... ...Gallon.	One.	One.
Do. do. do. Fort ... ...Gallon.	One.	One.
Oleum Carbolatum ... ...Gallon.	One.	One.
Lotio Zinci Chloridi ... ...Gallon.	Half.	Half.
Lotio Potassæ Permanganatis ... ...Gallon.	Half.	Half.
Boracic Lint ... ...Pound.	Half.	Half.
Carbolised Cotton ... ...Pound.	Half.	Half.
Confectio Sulphuris ... ...Pound.	Half.	Half.
Gargarisma Aluminis ... ...Gallon.	One.	One.
Glycerinum Ferri Perchloridi ... ...Ounces.	...	Two.
Guttæ Acidi Tannici ... ...Ounces.	...	Four.
Guttæ Iodi ... ...Ounce.	...	One.
Guttæ Opii ... ...Ounces.	...	Four.
Guttæ Zinci Chloridi ... ...Ounces.	...	Four.
Guttæ Atropiæ ... ...Ounce.	One.	...
Guttæ Atropiæ cum Oleo Ricini ... ...Ounce.	One.	...
Injectio Zinci Sulphatis ... ...Gallon.	One.	One.
Injectio Morphiæ Hypodermica ... ...Ounce.	One.	One.
Injectio Atropiæ Sulphatis ... ...Ounce.	One.	...
Injectio Chlorali Hydratis ... ...Ounce.	One.	...
Injectio Physostigmatis Hypodermica ...Ounce.	One.	...
Lotio Acidi Nitrici cum Opio ... ...Gallon.	...	Half
Lotio Alkalina ... ...Gallon.	Half.	Half.
Lotio Nigra ... ...Gallon.	One.	One.
Lotio Evaporans ... ...Gallon.	One.	One.
Lotio Plumbi cum Opio ... ...Pints.	...	Two.
Mistura Iodi ... ...Pints.	Two.	Two.
Mistura Potassii Iodidi ... ...Gallon.	One.	One.
Mistura Hydrargyri Perchloridi ... ...Gallon.	Half.	Half.
Mistura Cinchonini... ... ...Gallon.	Half.	Half.
Mistura Quinidini ... ...Gallon.	Half.	Half.
Mistura Quiniæ ... ...Gallon.	Half.	...
Mistura Cinchonæ ... ...Gallon.	One.	One.
Mistura Acidi Sulphurici cum Opio ...Pints.	Two.	Two.
Mistura Cretæ cum Catechu ... ...Pints.	Two.	Three.
Mistura Carminativa ... ...Pints.	Two.	Two.
Mistura Ipecacuanhæ Opiata ... ...Gallon.	One.	One.
Mistura Senegæ ... ...Pints.	Two.	Two.
Mistura Diaphoretica ... ...Gallon.	One.	Half.
Mistura Diuretica ... ...Gallon.	One.	Half.
Mistura Copaibæ ... ... Gallon.	Half.	One.
Mistura Ferri Diuretica ... ...Pints.	Two.	Two.
Mistura Sennæ Comp. ... ...Gallon.	One.	One.

List of Stock Medicines to be kept made up—(continued).

Name of Medicine.	In-patients' Dispensary.	Out-patients' Dispensary.
Mistura Magnesiæ et Magnesiæ Sulphatis..Gallon.	Half.	Half.
Mistura Rhei Composita ... ...Pints.	Two.	Two.
Mistura Bismuthi Sedativa ... ...Pint.	One.	One.
Mistura Effervescens ... ...Gallon.	Half.	Half.
Mistura Ammoniæ ... ...Pints.	Two.	Two
Mistura Stimulans ... ...Pints.	Two.	...
Mistura Strychniæ et Ferri ... ...Pint.	One.	One.
Mistura Sulphatis Triplicis ... ...Pint.	One.	One.
Mistura Ammonii Chloridi ... ...Pint.	One.	One.
Mistura Ferri Perchloridi ... ...Gallon.	Half.	Half.
Mistura Acidi Nitro-Hydrochlorici ...Gallon.	Half.	Half.
Twining's Spleen Mixture ... ...Pint.	...	One.
Mistura Olei Dipterocarpi ... ...Pints.	Two.	Two.
Pilula Colocynthidis et Calomelanos ...Pills.	50	50
Pilula Hydrargyri et Rhei ... ...Pills.	50	50
Pilula Calomelanos et Scillæ ... .. Pills.	50	50
Pilula Quiniæ Sulphatis ... ...Pills.	50	...
Ailula Quineti ... ...Pills.	100	100
Pilula Ipecacuanhæ et Opii ... ...Pills.	100	100
Pulvis Elaterii Compositus ... ...Ounce.	Half.	Half.
Pulvis Sodæ Compositus ... ...Ounce.	...	One.
Pulvis Santonini Compositus ... ...Ounces.	One.	Two.
Pulvis Emeticus ... ...Ounces.	One.	Two.
Pigmentum Iodi ... ...Ounce.	One.	One.
Pigmentum Belladonnæ ... ...Ounce.	One.	One.
Pigmentum Daturæ ... ...Ounce.	One.	One.
Syrupus Ferri Quiniæ et Strychniæ Phosphatis ... ...Ounces.	Two.	Two.
Unguentum Olei Dipterocarpi .. ...Ounces.	Eight.	Eight.
Unguentum Hydrargyri Perchloridi ...Ounces.	Two.	Two.
Unguentum Cretæ ... ...Ounces.	Eight.	Eight.
Unguentum Hydrargyri Nitratis Mitius..Ounce.	One.	One.
FOR CHILDREN.		
Mistura Acidi Gallici cum Opio ... ...Ounces.	...	Eight.
Mistura Alterativa ... ...Ounces.	...	Eight.
Mistura Hæmatoxyli ... ...Ounces.	...	Four.
Mistura Olei Ricini cum Opio ... ...Ounces.	...	Eight.
Mistura Stimulans, "Tanner's" ... ...Ounces.	...	Eight.
Pulvis Hydrargyri cum Ipecacuanhâ ...Ounce.	...	One.
Pulvis Santonini et Hydrargyri ... ...Ounces.	...	Two.
Pulvis Ipecacuanhæ et Potassæ Nitratis.Ounce.	...	One.
Pulvis Quiniæ et Potassæ Chloratis ...Ounce.	...	One.

FORMULÆ
USED AT THE
GENERAL HOSPITAL, MADRAS.

ANTISEPTICS, DISINFECTANTS, AND DEODORIZERS.

Lotio Acidi Carbolici.

Take of—

Carbolic acid	1 part.
Warm water	40 parts.

Mix.

Lotio Acidi Carbolici Fortior.

Take of—

Carbolic acid	1 part.
Warm water	20 parts.

Mix.

Oleum Carbolatum.

Take of—

Carbolic acid	1 part.
Cocoanut oil	20 parts.

Mix.

Lotio Zinci Chloridi.

Take of—

Chloride of zinc	40 grains.
Distilled water	1 pint.

Mix.

Lotio Sodæ Chlorinatæ.

Take of—

Solution of chlorinated soda ...	1 fl. ounce
Distilled water	1 pint.

Mix.

Lotio Potassæ Permanganatis.

Take of—

Solution of Permanganate of potash.	4 fl. drachms.
Distilled water	1 pint.

Mix.

(If Condy's disinfecting fluid is used, the strength should be two fluid drachms to one pint.)

BATHS.

Cold bath,	temperature of atmosphere.		Vapour.	Air.
Tepid do.	do.	85° to 92° F.	92° to 98°. F.	96° to 106°. F.
Warm do.	do.	92° to 98° „	98° to 116°. F.	106° to 120°. F.
Hot do.	do.	98° to 110° „	100° to 140°. F.	120° to 180°. F.

Balneum Acidi Nitro-Hydrochlorici.

Take of—

Diluted nitro-hydrochloric acid eight fluid ounces to each gallon of water.

Balneum Alkalinum.

Take of—

Carbonate of soda	4 ounces.
Warm water	30 gallons.

Dissolve.

Balneum Sinapis.

Take of—

Mustard in powder	2 ounces.
Warm water	4 gallons.

Mix.

Balneum Sulphuris.

Take of—

Sublimed sulphur	2 ounces.
Hyposulphite of soda	1 ounce.
Dilute sulphuric acid	½ ounce.
Water	30 gallons.

Mix.

Balneum Potassæ Sulphuratæ.

Take of—

Sulphurated potash	4 ounces.
Water	30 gallons.

Mix.

Balneum Aeris Calidi.

The patient, undressed, should sit on a closed-bottomed chair, and have one or two blankets wrapped round him, so as to be close about the neck and to come down to the floor all round. Then about one fluid ounce to two fluid ounces of spirit should be put in a spirit lamp on the floor below the chair and lit. This bath may also be administered to a patient in bed by covering all the body, except the head and face, with a blanket supported over the bed by a cord or bamboo frame-work, and then heating as before. A quarter of an hour should suffice for the administration of the bath. Lee's lamp for heating this bath should be used when available.

Balneum Vaporis.

Place the patient naked on a cane-bottomed chair and envelop him in a blanket, as directed in the hot-air bath. Then set under the chair a small copper bath full of hot water and supported on legs, and place below it a lighted spirit lamp with a strong flame. Lee's lamp may be used.

This bath may be medicated by subliming calomel, iodine sulphur, &c., on a heated metallic plate.

BOLUSES.

Bolus Ipecacuanhæ.

Take of—

Powder of ipecacuanha	20 grains.
Simple syrup, a sufficiency.	

Mix.

To be generally preceded by an opiate draught.

BOUGIA.

These are usually made about the size of a No. 9 Catheter and in length two inches.

Gallic acid, 1 grain; Tannic acid, 1 grain; Nitrate of Silver, ½ or ¼ grain; extract of belladonna, ½ grain; sulphate of copper, 1 grain; Perchloride of iron, 1 grain; opium, 1 or 2 grains; dried sulphate of zinc, 1 grain.

Take any of the above drugs and make them into a bougie with oil of theobroma, five parts; mutton suet, five parts; spermaceti, sixty parts.

DRESSINGS.

Boracic Lint.

Steep clean lint for ten minutes in a saturated solution of boracic acid in boiling water; drain and hang up till dry.

Carbolished Catgut Ligatures.

Dissolve one part of chromic acid in 4000 parts of distilled water, and add to the solution 200 parts of pure carbolic acid, or absolute phenol. This forms a one to 20 solution of carbolic acid in an extremely dilute solution of chromic acid, but minute as is the quantity of chromic acid, it exerts when in conjunction with carbolic acid, a most powerful effect upon the gut. The first effect of the addition of the carbolic acid to the chromic solution is to change its pale yellow colour to a rich golden tint; but if the liquid is allowed to stand without the introduction of the catgut, it changes in the course of a few hours to a dingy reddish brown, in consequence of some mutual reaction of the two acids, and a considerable amount of grey precipitate is formed. If, however, catgut about equal in weight to the carbolic acid is added as soon as the ingredients are mixed, the liquid retains its brightness, and the only change observed is a gradual diminution of the depth of the yellow colour; the precipitate which probably occurs taking place into the substance of the catgut. As soon, therefore, as the preparing liquid has been made, catgut equal in weight to the phenol is introduced into it, if there is too large a proportion of catgut it will not be sufficiently prepared, if too small, it may run the risk of being over prepared. At the end of forty-eight hours, it is sufficiently prepared. It is then taken out of the solution, and dried, and when dry, is placed in one to five carbolic oil; it is then fit for use.

Always test the strain of your prepared catgut before using it.—Professor Lyster, *Lancet,* Feb. 5-12-1881, pp. 201 and 275.

Carbolised Cotton.

Place an open cup full of carbolic acid in a closed tin box filled with well cleaned cotton previously boiled in an alkaline solution.

Drainage tubes of Decalcified bone.

Surgeon Deakin in the *Indian Medical Gazette* of the 1st October 1880, proposes the use of the long bones of the limbs of poultry and game birds.

" Long bones of the size required are well boiled to rid them of the soft parts. They are then placed for ten hours in a mixture of one part of hydrochloric acid and two parts of water, this renders the bones soft and pliable, almost

all the earthy salts being dissolved out so that the ends of the bones can be cut off with a pair of scissors. This having been done, the medullary canal of the shaft should be well cleaned out with a thick wire, or, better, with a fine rat-tailed file, and the bone tube should then be well boiled in a five per cent. watery solution of carbolic acid to which some borax has been added. The tubes should be kept in a five per cent carbolic oil."

Dr. Neuber of Keil prepared his tubes from the bones of the ox, the horse or other animals, he turned the bones the proper size and length. The prolonged boiling of the decalcified bones leaves principally gelatine.

Lister's Antiseptic Gauze.

Vide Lancet, page 365, Vol. I, 1875, and page 901, Vol. II, 1879.

Unbleached muslin should be used.

The materials used for charging the gauze are—

Carbolic acid	1 part.
Resin	4 parts.
Paraffin	4 parts.

"In order to charge the gauze, the paraffin and resin are first melted together in a water-bath, after which the acid is added and blended by stirring. The object now is to diffuse this melted mixture equally through the cotton cloth, and for this purpose two things are requisite, *viz.*, that the cotton be at a higher temperature than the melting point of the mixture, and that it be subjected to moderate pressure after receiving it. The cotton cloth, a yard wide, is cut into six-yard lengths, and these having been folded so as to be half a yard square, are placed in a dry hot chamber formed of two tin boxes placed one inside the other, with an interval to receive water, which is kept boiling by fire or gas beneath, the upper edges being connected and provided with an exit pipe for the steam. There is also a glass tube arranged as a gauge of the amount of the water, and the chamber has a properly fitting lid. The bottom of the chamber is strengthened with an iron plate to enable it to bear the weight used for compressing the gauze when charged. This is a piece of wood about two inches thick, nearly fitting the chamber, covered with sheet lead, so as to make it about as heavy as a man can lift by means of two handles in the upper surface. The weight is heated along with the cotton, and is put first into the chamber so as to leave the cotton loose for the penetration of the heat, which occupies two or three hours. The cotton, when heated, is taken out of the chamber along with the weight, and placed in a wooden box to protect it from the cold. (It would be better to have a second hot chamber for this purpose, since in cold weather the cotton is apt to be too much cooled in spite of the protection of the wooden box.) The heated gauze is then at once charged with the melted mixture of carbolic acid, resin, and paraffin, in quantity equal to the weight of the cotton fabric (or slightly less), and, in order to diffuse the liquid as equally as possible, it is sprinkled over the gauze by means of a syringe with a number of minute perforations in its extremity, the body of the syringe and the piston-rod having each a wooden handle to protect the hands of the workman from the heat. The syringe is constructed to hold half the quantity of the mixture required for charging one piece of cloth. One folded piece being placed at the bottom of the hot chamber, its upper half is raised and turned aside, and one syringeful is sprinkled over the lower half. The upper half is then put back into position and the syringeful thrown on. The same process is repeated with all the other pieces of gauze, after which the weight is put into the chamber to compress the charged cotton, and the lid applied. An hour or two are then allowed to elapse to permit the complete diffusion of the liquid, when the material is fit for use."

This gauze is supposed to be used "in eight layers with a piece of mackintosh under the outer fold."

Lister's "protective" consists essentially of oiled silk varnished on both sides with copal varnish.

ELECTUARIES.

Confectio Copaibæ et Cubebæ.

Take of—

Copaiba	1½ fl. ounce.
Cubebs, powdered	480 grains.
Camphor	120 grains.
Extract of hyoscyamus	120 grains.
Carbonate of magnesia	90 grains.
Honey	2 fl. ounces.

Mix.

Dose, a tea-spoonful three times a day.

Confectio Sulphuris.

Take of—

Precipitated sulphur	30 grains.
Acid tartrate of potash	60 grains.

Honey, a sufficiency for one dose.

Mix.

Confectio Sulphuris et Guaiaci.

(Chelsea Pensioner.)

Take of—

Guaiacum resin	60 grains
Powdered rhubarb	120 grains.
Acid tartrate of potash	1 ounce.
Sublimed sulphur	1 ounce.
Nutmeg powdered	One.
Honey	16 ounces.

Mix.

Dose, a tea-spoonful three times a day.

Confectio Sulphuris Composita, "Graves."

Take of—

Confection of senna	1 ounce.
Flowers of sulphur *(sublimed)*	1 ounce.
Powdered jalap	60 grains.
Copaiba	½ ounce.
Powdered ginger	30 grains.
Acid tartrate of potash	½ ounce.

Syrup of ginger, a sufficiency to make a confection.

Dose, a tea-spoonful to be taken night and morning.

Confectio Aperiens.

Take of—

Jalap in powder	10 grains.
Rhubarb in powder	5 grains.
Acid tartrate of potash	60 grains.
Powdered ginger	10 grains.

Honey, a sufficiency.

Mix for one dose.

ENEMATA.

Enema Ferri Perchloridi.

Take of—

Tincture of the perchloride of iron.	1½ fl. drachm.
Pure water	8 fl. ounces.

Mix.

Enema Aloes.

Take of—

Socotrine aloes	40 grains.

Carbonate of potash	15 grains.
Mucilage of starch	10 fl. ounces.

Mix.

Enema Commune.

Take of—

Table salt	1 ounce.
Congee-water	20 fl. ounces.

Mix.

Enema Astringens.

Take of—

Subnitrate of bismuth	20 grains.
Tincture of catechu	1 fl. drachm.
Solution of hydro-chlorate of morphia.	30 minims.
Mucilage of starch or barley water.	2 fl. ounces.

Or substitute the solution of bismuth and citrate of ammonia one drachm, omitting the tincture of catechu.

Enema Olei Ricini.

Take of—

Castor-oil	2 fl. ounces.
Congee-water	12 fl. ounces.

Mix.

Enema Ipecacuanhæ.

Take of—

Ipecacuanha in powder	40 grains.
Tincture of opium	20 minims.
Tepid water	3 fl. ounces.

Mix.

Enema Opii.

Take of—

Tincture of opium	1 fl. drachm.
Mucilage of starch	3 fl. ounces.

Mix.

Enema Terebinthinæ.

Take of—

Oil of turpentine	1 fl. ounce.
Castor-oil	½ fl. ounce.
Congee-water	18½ fl. ounces.

Mix.

Enema Assafœtidæ.

Take of—

Tincture of assafœtida	1 fl. ounce.
Congee-water	19 fl. ounces.

Mix.

Enema Nutritivum.

Take of—

Milk	½ ounce.
Egg	One.
Brandy or arrack	½ ounce.
Tincture of opium	20 minims.
Essence of beef or strong beef-tea.	2 to 4 ounces.

Mix.

FOMENTATIONS.

Fotus Camphoræ et Opii.

Flannel or spongio-piline wrung out of hot water and sprinkled with the following :—

Tincture of opium Spirits of camphor	of each 2 fl. drachms.

Mix.

Fotus Papaveris.

Take of—

Poppy capsules sliced and pounded in a mortar	Four.
Water	30 fl. ounces.

Mix.

Boil for 15 minutes and strain.

Fotus Terebinthinæ.

Flannel or spongio-piline wrung out of hot water (150° F.) and sprinkled with half a fluid ounce of turpentine and changed in twenty minutes.

GARGLES.

Gargarisma Acidi Hydrochlorici.

Take of—

Diluted hydrochloric acid	2 fl. drachms.

Honey	½ fl. ounce.
Water	7½ fl. ounces.

Mix.

Gargarisma Acidi Tannici.

Take of—

Tannic acid	120 grains.
Honey	½ fl. ounce.
Rectified spirit	½ fl. ounce.
Water	7½ fl. ounces.

Mix.

Gargarisma Aluminis.

Take of—

Alum	180 grains.
Tincture of capsicum	2 fl. drachms.
Water	to 8 fl. ounces.

Mix.

Gargarisma Boracis.

Take of—

Borax	120 grains.
Honey	4 fl. drachms.
Water	to 8 fl. ounces.

Mix.

Gargarisma Sodæ Chlorinatæ.

Take of—

Solution of chlorinated soda	4 fl. drachms.
Water	to 8 fl. ounces.

Mix.

Gargarisma Potassæ Chloratis.

Take of—

Chlorate of potash	120 grains.
Water	1 pint.

Mix.

GLYCERINE.

Glycerinum Ferri Perchloridi.

Take of—

Glycerine	1 fl. ounce.
Tincture of the perchloride of iron.	1 fl. ounce.

Mix.

DROPS.

Guttæ Acidi Tannici.

Take of—

Tannic acid	60 grains.
Glycerine	1 fl. ounce.

Rub them up together in a mortar, then transfer them to a porcelain dish and apply a gentle heat until complete solution is effected.

Guttæ Argenti Nitratis.

Of different strengths, from 1 to 20 grains to one ounce of distilled water.

Guttæ Atropiæ.

Take of—

Sulphate of atropine	2 grains.
Distilled water	1 fl. ounce.

Mix.

Guttæ Atropiæ cum Oleo Ricini.

Take of—

Sulphate of atropine	1 grain.
Castor oil	1 fl. ounce.

Mix.

Guttæ Iodi.

(Iodine drops for the ear.)

Take of—

Tincture of iodine	1 fl. drachm.
Iodine	1 grain.
Rectified spirit	1 fl. drachm.

Mix.

Guttæ Opii.

Take of—

Liquid extract of opium	1 fl. drachm.
Glycerine	3 fl. drachms.
Distilled water	4 fl. drachms.

Mix.

Guttæ Zinci Chloridi.

Take of—

Chloride of zinc	1 grain.
Glycerine	3 fl. drachms.
Water	5 fl. drachms.

INJECTIONS.

Injectio Plumbi Acetatis.

Take of—

Acetate of lead	12 grains.
Water	12 fl. ounces.

Dissolve.

Injectio Zinci Sulphatis.

Take of—

Sulphate of zinc	12 grains.
Water	12 fl. ounces.

Dissolve.

Injectio Zinci Chloridi Fortior.

Take of—

Chloride of zinc	24 grains.
Water	12 fl. ounces.

Dissolve.

Injectio Zinci Chloridi Mitior.

Take of—

Chloride of zinc	12 grains.
Water	12 fl. ounces.

Dissolve.

INJECTIONS (HYPODERMIC.)

Injectio Morphiæ Hypodermica.

Prepared as in the Supplement to the British Pharmacopœia.

Strength, 1 grain of acetate of morphia in 12 minims of the solution.

Dose, 1 to 6 minims.

Injectio Atropiæ Sulphatis Hypodermica.

Take of—

Solution of sulphate of atropia B. P.	1 fl. drachm.
Distilled water	2 fl. drachms.

Strength, 6 minims contain $\frac{1}{60}$ grain of sulphate of atropine.

Dose, 3 to 6 minims.

Injectio Morphiæ et Atropiæ Hypodermica, “Squires.’ ”

Take of—

Sulphate of atropia	1 grain.
Acetate of morphia	10 grains.
Water	1 drachm.

Each minim contains $\frac{1}{60}$th of a grain of sulphate of atropia and $\frac{1}{6}$th of a grain of acetate of morphia.

Dose, 2 or 3 minims.

Injectio Chlorali Hydratis Hypodermica.

Take of—

Chloral hydrate	10 grains.
Distilled water	1 fl. drachm.

Mix.

Strength, 12 minims contain 2 grains of chloral hydrate.

Dose, 12 to 36 minims.

Injectio Physostigmatis Hypodermica.

Take of—

Extract of calabar bean	10 grains.
Rectified spirit, a sufficiency.	
Distilled water to make	2 fl. drachms.

Dissolve the extract in the spirit, then add water and mix.

Strength, 12 minims contain 1 grain of the extract.

Dose, 2 to 6 minims.

LIQUOR.

Liquor Arsenici et Hydrargyri Hydriodātis.
(Donovan.)

Take of—

Pure arsenic in fine powder	6 grains.
Pure Mercury	16 grains.
Pure Iodine	50½ grains.
Alcohol	half a fluid drachm.

Distilled water nine fluid ounces or a sufficiency.

Rub together the arsenic, mercury, iodine, and spirit until a dry mass is obtained, and having triturated eight ounces of the water with this in successive portions, let the whole be transferred to a flask, and heated till it boils; when cool and filtered, let as much distilled water be added to it as will make the bulk of the solution exactly eight fluid ounces and six fluid drachms.

Each drachm contains $\frac{1}{12}$ grain of oxide of arsenic, $\frac{1}{4}$ grain of oxide of mercury $\frac{6}{7}$ of a grain of Iodine in the shape of hydriodic acid, in chemical combination.

Dose.—Minims 10 to 30 largely diluted with *distilled* water thrice a day.

LOTIONS.

Lotio Acidi Boracici.

A saturated solution of Boracic acid in boiling water to be filtered when cool.

Lotio Acidi Nitrici cum Opio.

Take of—

Nitric acid	30 minims.
Tincture of opium	30 minims.
Water	to 10 fl. ounces.

Mix.

Lotio Alkalina.

Take of—

Carbonate of potash or soda ...	1 ounce.
Water	20 fl. ounces.

Mix.

(Bicarbonate is not to be used.)

Lotio Nigra.

Take of—

Calomel	30 grains.
Limewater	6 fl. ounces.

Mix.

Lotio Evaporans.

Take of—

Hydrochlorate of ammonia ...	180 grains.
Vinegar	2 fl. ounces.
Arrack	2 fl. ounces.
Water	6 fl. ounces.

Mix.

Lotio Plumbi cum Opio.

Take of

Solution of the subacetate of lead	30 minims.

Tincture of opium	1½ fl. drachms.
Water	to 6 fl. ounces.

Mix.

Lotio Opii.

Take of—

Opium	36 grains.
Boiling water	6 fl. ounces.

Macerate and apply warm on lint under oiled silk.

Lotio Zinci Rubra.

Take of—

Sulphate of zinc	20 grains.
Compound tincture of lavender	1 fl. drachm.
Water	to 6 fl. ounces.

Mix

Lotio Sedativa.

(Eau Sédative.)

Take of—

Spirits of camphor	1 fl. drachm.
Strong solution of ammonia.	7 fl. drachms.
Distilled water	12½ fl. ounces.

Mix.

MIXTURES (ALTERATIVE.)

Mistura Iodi.

Take of—

Iodine	1½ grains.
Iodide of potassium	36 grains.
Distilled water	11½ fl. ounces.

Dissolve.

Dose, one fluid ounce.

Mistura Potassii Iodidi.

Take of—

Iodide of potassium	120 grains.
Aromatic spirits of ammonia	120 minims.
Infusion of gentian	24 fl. ounces.

Mix.

Dose, 1 to 1½ ounces.

Mistura Hydrargyri Perchloridi.

Take of—

Solution of perchloride of mercury, B. P.	12 fl. drachms.
Distilled water	9 fl. ounces.
Compound tincture of cinchona	1½ fl. ounces.
Tincture of rhubarb	6 fl. drachms.

First add the solution of perchloride to the water and then add the tinctures.

Strength, each fluid ounce contains $\frac{1}{16}$ grain of perchloride of mercury.

Dose, 1 fluid ounce.

MIXTURES (ANTIPERIODIC).

Mistura Cinchonini.

Take of—

Sulphate of cinchonine	16 grains.
Dilute sulphuric acid	20 minims.
Water	to 4 fl. ounces.

Mix.

Dose, 1 to 2 ounces.

Mistura Quiniæ.

Take of—

Sulphate of quinine.	48 grains.
Dilute sulphuric acid	40 minims.
Tincture of orange peel	2 fl. drachms.
Syrup	6 fl. drachms.
Water	11 fl. ounces.

Dissolve the quinine in the acid, first mixed in half an ounce of water, then add the other ingredients and the water.

Dose, 1 to 3 ounces.

Mistura Quinidini.

Take of—

Sulphate of quinidine	16 grains.
Dilute sulphuric acid	20 minims.
Water	4 fl. ounces.

Mix.

Dose, 1 or 2 ounces.

Mistura Cinchonæ.

(Fever Mixture.)

Take of—

Cinchona bark (in coarse powder).	1¼ ounces.
Dilute hydrochloric acid...	2 drachms.
Water, a sufficiency.	

Boil the cinchona bark for ten minutes in ten ounces of water and filter.

Mix the hydrochloric acid with ten ounces of water and pour it slowly over the dregs in the strainer, finally pass enough water through the filter to make the product measure one pint.

Dose, 1 to 3 ounces.

MIXTURES (ASTRINGENT).

Mistura Acidi Sulphurici cum Opio.

Take of—

Dilute sulphuric acid	2 fl. drachms.
Tincture of opium	2 fl. drachms.
Cinnamon water	11½ fl. ounces.

Mix.

Dose, 1 fluid ounce.

Mistura Cretæ cum Catechu.

Take of—

Chalk mixture	5½ fl. ounces.
Tincture of catechu	2 fl. drachms.
Tincture of opium	½ fl. drachm.
Chloroform	½ fl. drachm.
Ipecacuanha wine...	1 fl. drachm.

Mix.

Dose, 1 fluid ounce.

Mistura Ferri Pernitratis.

Take of—

Solution of pernitrate of iron	2 fl. drachms.
Tincture of opium	½ fl. drachm.
Infusion of cusparia to make	6 fl. ounces.

Mix.

Dose, 1 fluid ounce.

Mistura Carminativa.

Take of—

Aromatic spirits of ammonia	3 fl. drachms.
Bicarbonate of soda	90 grains.
Compound tincture of cardamoms.	6 fl. drachms.
Spirits of chloroform	3 fl. drachms.
Peppermint water	10½ fl. ounces.

Mix.

Dose, 1 fluid ounce.

Cholera Drops.

Take of—

Sulphuric acid	8 minims.
Rectified spirit	24 minims.
Oil of anise	30 minims.
Oil of cajeput	30 minims.
Oil of juniper	30 minims.
Ether	½ fl. ounce.
Tincture of cinnamon	2 fl. ounces.

Mix.

Dose, 10 minims in half a wine-glassful of water.

Russian Cholera Drops.

Take of—

Ammoniated tincture of valerain.	2 fl. drachms.
Ipecacuanha wine	1 fl. drachm.
Tincture of opium	1½ fl. drachms.
Oil of peppermint	5 minims.

Mix.

Dose, 20 to 25 drops every hour in sugar.

Cholera Saline.

Take of—

Chloride of sodium	150 grains.
Bicarbonate of soda	30 grains.
Phosphate of soda	50 grains.
Bicarbonate of potash	30 grains.
Solution of chlorinated soda	2½ fl. drachms.
Water.	10 fl. ounces.

Dose, ½ to 1 ounce.

COUGH MIXTURES.

Mistura Cascarillæ.

Take of—

Tincture of squills	3 fl. drachms.
Compound tincture of camphor	1½ fl. ounces.
Infusion of cascarilla to make	12 fl. ounces.

Mix.

Dose, 1 fluid ounce.

Mistura Ipecacuanhæ Opiata.

Take of—

Bicarbonate of soda	60 grains.
Ipecacuanha wine	2 fl. drachms.
Spirit of chloroform	3 fl. drachms.
Compound tincture of camphor	4 fl. drachms.
Distilled water	11 fl. ounces.

Dose, 1 fluid ounce.

Linctus Opiatus.

Take of—

Tincture of opium	2 fl. drachms.
Dilute sulphuric acid	2½ fl. drachms.
Treacle	8 fl. ounces.
Water	3 fl. ounces.

Mix the treacle with the water and then add the acid and tincture.

Dose, 1 to two tea-spoonsful.

Mistura Senegæ.

Take of—

Carbonate of ammonia	60 grains.
Tincture of senega	6 fl. drachms.
Infusion of senega	6 fl. ounces.
Distilled water	5¼ fl. ounces.

Dose, 1 fluid ounce.

DIAPHORETIC MIXTURES.

Mistura Diaphoretica.

Take of—

Solution of acetate of ammonia	1½ fl. ounces.
Spirit of nitrous ether	1½ fl. drachms.

Tincture of Hyoscyamus... ...	2 fl. drachms.
Nitrate of potash	30 grains.
Infusion of serpentaria to make ...	8 fl. ounces.

Mix.

Dose, 1 to 2 ounces.

Mistura Serpentariæ.

Take of—

Spirit of nitrous ether	6 fl. drachms.
Spirit of chloroform	6 fl. drachms.
Solution of acetate of ammonia...	6 fl. ounces.
Infusion of serpentaria	6 fl. ounces.

Dose, 1 ounce.

DIURETIC MIXTURES.

Mistura Diuretica.

Take of—

Spirit of juniper	3 fl drachms.
Acetate of potash...	220 grains.
Nitrate of potash	120 grains.
Spirit of nitrous ether	6 fl. drachms.
Decoction of broom to make ...	12 fl. ounces.

Mix.

Dose, 1 ounce.

Mistura Copaibæ.

Take of—

Copaiba	1 fl. ounce.
Solution of potash	½ fl. ounce.
Spirit of nitrous ether.	½ fl. ounce.
Acacia powder	80 grains.
Tincture of hyoscyamus	½ fl. ounce.
Cinnamon water	5½ fl. ounces.

Mix.

Dose, ½ a fluid ounce.

Mistura Ferri Diuretica.

Take of—

Tincture of perchloride of iron ...	1 fl. drachm.
Dilute nitro-muriatic acid ...	1 fl. drachm.
Spirit of chloroform	3 fl. drachms.

Spirit of juniper	2 fl. drachms.
Infusion of quassia	2 fl. drachms.
Decoction of broom to make	12 fl. ounces.

Dose, 1 to 2 fluid ounces.

Mistura Digitalis et Scillæ.

Take of—

Tincture of digitalis	2 drachms.
Tincture of squill	2 drachms.
Decoction of broom	12 ounces.

Mix.

Dose, 1 ounce.

PURGATIVE MIXTURES.

Mistura Sennæ Composita.

(Black Draught.)

Take of—

Sulphate of magnesia	5 ounces.
Strong tincture of ginger	1 fl. drachm.
Infusion of senna	1 pint.

Mix.

Dose, 2 to 4 ounces.

SALINE MIXTURES.

Mistura Potassæ Nitratis.

Take of—

Nitrate of potash	180 grains.
Peppermint water	10½ fl. ounces.
Spirit of nitrous ether	3 fl. drachms.
Syrup of lemons	1 fl. ounce.

Mix.

Dose, 1 fluid ounce.

Mistura Potassæ Chloratis.

Take of—

Chlorate of potash in powder	120 grains.
Decoction of cinchona	12 fl. ounces.

Dissolve.

Dose, 1 fluid ounce.

Mistura Magnesiæ et Magnesiæ Sulphatis.

Take of—

Carbonate of magnesia ...	... 126 grains.
Sulphate of magnesia ...	... 2 ounces.
Peppermint water ...	... 12 fl. ounces.

Dissolve the sulphate of magnesia in the peppermint water and finally rub down with it the carbonate in a mortar.

Dose, 1 fluid ounce.

Mistura Rhæi Composita.

Take of—

Rhubarb root, powdered ...	... 50 grains.
Calumba root, powdered ...	... 100 grains.
Bicarbonate of soda ...	... 100 grains.
Peppermint water ...	... 12 fl. ounces

Rub the rhubarb, soda, and calumba well together and then gradually add the peppermint water.

Dose, 1 fluid ounce.

SEDATIVE MIXTURES.

Mistura Bismuthi Sedativa.

Take of—

Subnitrate of bismuth ...	... 84 grains.
Bicarbonate of soda ...	... 84 grains.
Solution of hydrochlorate of morphia	... 2 fl. drachms.
Mucilage of gum acacia ...	... 1½ fl. ounces.
Distilled water to make ...	... 12 fl. ounces.

Rub the bismuth and soda well together, then mix with the mucilage, add the water gradually, and lastly, the morphia.

Dose, 1 fluid ounce.

Mistura Effervescens.

Take of—

Bicarbonate of soda ...	... 20 grains.
Water	... 1 fl. ounce.

Mix and dissolve in one glass.

Take of—

Tartaric acid	... 15 grains.

Water	1 fl. ounce.

Mix and dissolve in another glass.

Dose. The fluids to be mixed and drunk during effervescence.

STIMULANT MIXTURES.

Mistura Ammoniæ Effervescens.

Take of—

Carbonate of ammonia	15 grains.
Water	1 fl. ounce.

Mix and dissolve in one glass.

Take of—

Citric acid	17 grains.
Water	1 fl. ounce.

Mix and dissolve in another glass.

Dose. The fluids to be mixed and drunk during effervescence.

Mistura Ammoniæ.

Take of—

Carbonate of ammonia	40 grains.
Treacle.	4 fl. drachms.
Compound tincture of lavender.	4 fl. drachms.
Peppermint water	11 fl. ounces.

Dissolve the treacle in the peppermint water and then add the ammonia and lavendar.

Dose, 1 to 2 ounces.

Mistura Stimulans.

Take of—

Aromatic spirits of ammonia	6 fl. drachms.
Spirit of ether	1½ fl. ounces.
Chloroform water	12 fl. ounces.

Mix.

Dose, 1 ounce.

Mistura Spiritus Vini Indici.

Take of—

Arrack	4 fl. ounces.
Yolk of eggs	Two.

Cinnamon water	6 fl. ounces.
White sugar	120 grains.

Dose, 1½ to 2 ounces.

Mistura Terebinthinæ Alcohlolica.

(Turpentine Punch. "Graves.")

Take of—

Spirits of turpentine	1 fl. ounce.
Brandy or arrack...	2 fl. ounces.
Sugar, a sufficiency.	
Boiling water	8 fl. ounces.

Mix.

Half for a dose, to be repeated if necessary every third hour.

TONIC MIXTURES.

Mistura Ferri Perchloridi.

Take of—

Tincture of perchloride of iron ...	2 fl. drachms.
Infusion of quassia	to 12 fl. ounces.

Mix.

Dose, 1 fluid ounce.

Mistura Strychniæ et Ferri.

Take of—

Solution of strychnia	40 minims.
Dilute nitro-muriatic acid ...	80 minims.
Tincture of perchloride of iron ...	80 minims.
Syrup of orange peel	4 fl. drachms.
Water	to 8 fl. ounces.

Dose, ½ to 1 ounce three times a day.

Mistura Ferri Phosphatis.

Take of—

Phosphate of iron	120 grains.
Dilute phosphoric acid	4 fl. drachms.
Phosphate of lime	180 grains.
Syrup	3 fl. drachms.
Water	to 12 fl. ounces.

Dose, 1 to 1½ ounce.

Mistura Sulphatis Triplicis.

Take of—

Sulphate of quinine ...	... 24 grains.
Sulphate of iron ...	... 24 grains.
Sulphate of magnesia ...	... 2 ounces.
Dilute sulphuric acid ...	... 120 minims.
Peppermint water ...	...to 12 fl. ounces.

Mix.

Dose, 1 ounce.

Mistura Acidi Nitro-Hydrochlorici.

Take of—

Diluted nitro-hydrochloric acid...	2 fl. drachms.
Infusion of chiretta ...	...to 12 fl. ounces.

Mix.

Dose, 1 fluid ounce.

Mistura Hepatica.

Take of—

Sulphate of quinine ...	... 36 grains.
Chloride of ammonium ...	... 240 grains.
Dilute hydrochloric acid...	... 2 fl. drachms.
Infusion of chiretta ...	...to 12 fl. ounces.

Mix.

Dose, 1 ounce.

Mistura Ammonii Chloridi.

Take of—

Chloride of ammonium ...	... 240 grains.
Infusion of chiretta ...	... 12 fl. ounces.

Mix.

Dose, 1 ounce.

Twining's Mixture for Enlarged Spleen.

Take of—

Powdered jalap	... 120 grains.
Powdered rhubarb ...	... 120 grains.
Powdered calumba ...	... 120 grains.
Acid tartrate of potash ...	... 60 grains.
Powdered ginger ...	... 60 grains.
Sulphate of iron ...	... 10 grains.

Tincture of senna	4 fl. drachms.
Peppermint water ...	...to 40 fl. ounces.

Mix.

Dose, 1 ounce.

Mistura Olei Dipterocarpi.

Take of—

Gurjun oil } equal parts.
Lime water }

Mix.

Dose, a dessert-spoonful twice a day.

Mistura Baelæ.

(*Bael Mixture.*)

Take of the soft tenacious pulp of the interior of the fruit two fluid ounces; water, four ounces; mix thoroughly and add sugar two ounces or sufficient to render it palatable. Pass the mixture through coarse muslin. A little lime juice may be added to improve the flavour.

The above is a dose, or it may be given in small and repeated doses.

MUCILAGES.

Mucilago Acaciæ.

Take of—

Gum acacia in small pieces ...	4 ounces.
Distilled water	6 fl. ounces.

Put the gum and water into a covered earthen jar and stir them frequently until the gum is dissolved. If necessary, strain the solution through muslin.

Mucilago Amyli.

Take of—

Starch	120 grains.
Distilled water	10 fl. ounces.

Triturate the starch with the water, gradually added, then boil for a few minutes, constantly stirring.

PILLS.

Pilula Colocynthidis et Calomelanos.

(*Colocynth and Calomel Pill.*)

Take of—

Compound pill of colocynth ...	48 grains.

Calomel	12 grains.

Mix and form 12 pills.
Dose, 1, 2, or 3 pills.

Pilula Hydrargyri et Rhæi.

(Rhubarb and Blue Pills.)

Take of—

Mercurial pill	30 grains.
Compound rhubarb pill	30 grains.

Mix accurately and divide into 12 pills.
Dose, 1 or 2 pills.

Pilula Calomelanos et Scillæ.

(Calomel and Squill Pill.)

Take of—

Calomel	12 grains.
Squill root, powdered	12 grains.
Digitalis leaf, powdered	12 grains.
Extract of hyoscyamus	20 grains.

Mix and make into 12 pills.
Dose, 1 pill.

Pilula Camphoræ et Hyoscyami.

(Camphor and Hyoscyamus Pill.)

Take of—

Camphor	24 grains.
Extract of hyoscyamus	36 grains.

Mix and divide into 12 pills.
Dose, 1 or 2 pills.

Pilula Quiniæ Sulphatis.

Take of—

Sulphate of quinine	60 grains.

Lime juice, a sufficiency.
Mix carefully and make into 12 pills.
Dose, 1 to 4 pills.

Pilula Quineti.

(Darjeeling Alkaloid Pill.)

Take of—

Quinetum	60 grains.

Lime juice, a sufficiency.
Mix carefully and make into 12 pills.
Dose, 1 to 4 pills.

Patterson's Cholera Pills.

Take of—

Calomel Opium Camphor	of each 1 oz. and 20 grains.
Acetate of lead	1 oz. and 40 grains.
Acetic acid	1 fl. drachm.
Aromatic powder	4 oz. and 80 grains.

Distilled water, a sufficiency.

Dissolve the acetate of lead in the acetic acid and rub up with the opium and camphor, the latter being powdered with the aid of a few drops of rectified spirit. Then add the calomel and aromatic powder with a sufficiency of distilled water to form the whole into a mass, which must be beaten up in a marble mortar and divided into 1,000 pills.

Each pill contains half a grain each of calomel, opium, and camphor, one grain of acetate of lead and two grains of aromatic powder.

Dose, 1 or 2 pills as required.

Pilula Ipecacuanhæ cum Opio.

(Ipecacuanha and Opium Pill.)

Take of—

Ipecacuanha powder	48 grains.
Extract of opium	6 grains.

Mix and divide into 24 pills.
Dose, 1, 2, or more pills.

Pilula Ipecacuanhæ cum Hydrargyro et Opio.

(Ipecacuan and Opium Pill with Mercury.)

Take of—

Mercurial pill	24 grains.
Ipecacuanha powder	36 grains.
Compound ipecacuanha powder	72 grains.

Mix and divide into 24 pills.

Dose, 1 or 2 pills.

Pilula Ferri Sulphatis, "Blaud."

Take of—

Pure sulphate of iron.
Pure Carbonate of potash of each ¼ of an ounce.
Powdered gum Tragacanth, a sufficient quantity.

Make into 46 pills.

Dose, 3 pills, increased to 4 or 5; if well borne, thrice daily.

Each pill contains about 2 grains of sulphate of iron.

PTISAN.

Ptisana Imperialis.

(Imperial Drink.)

Take of—

Acid tartrate of potash	120 grains.
Lime peel	120 grains.
Lime juice	2 fl. ounces.
Sugar	2 to 4 ounces.
Boiling water	to 24 fl. ounces.

Macerate till cool and strain.

POWDERS.

Pulvis Elaterii Compositus.

Take of—

Extract of elaterium in powder	4 grains.
Acid tartrate of potash	100 grains.
Ginger in powder	20 grains.

Mix thoroughly.

Dose, 5 to 30 grains.

Pulvis Emeticus.

Take of—

Powdered ipecacuanha root	1 ounce.
Tartarated antimony	12 grains.

Mix.

Dose, 5 to 20 grains.

Pulvis Rhæi Salinus.

Take of—

Rhubarb, in powder	60 grains.
Sulphate of potash	120 grains.

Mix.

Dose, from 15 to 40 grains.

Pulvis Sodæ et Hydrargyri.

Take of—

Carbonate of soda dried	30 grains.
Calomel	6 grains.
Aromatic powder of chalk	60 grains.

Rub well together.

Dose, from 5 to 16 grains.

Pulvis Sodæ Compositus.

Take of—

Bicarbonate of soda	300 grains.
Ipecacuanha in powder	240 grains.
Opium in powder	60 grains.

Dose, 5 to 15 grains.

Pulvis Santonini Co.

(*Worm Powders.*)

Take of—

Santonine	20 grains.
Powdered ginger	20 grains.
Powdered seeds of *Butea frondosa.*	400 grains.

Dose, 15 to 25 grains morning and evening, to be followed by a purgative.

PIGMENTS.

Belladonna Pigment.

Take of—

Extract of belladonna	120 grains.
Glycerine, a sufficiency.	

Rub the extract of belladonna in a mortar with a little glycerine, using sufficient to make it into a thin paste.

Datura Pigment.

To be prepared in the same way.

SYRUPS.

Syrupus Ferri Quiniæ et Strychniæ Phosphatis.

(Syrup of the triple Phosphate.)

Take of—

Sulphate of iron	300 grains.
Phosphate of soda	360 grains.
Sulphate of quinine	192 grains.
Dilute sulphuric acid Solution of ammonia	of each a sufficiency.
Strychnia	9 grains.
Dilute phosphoric acid	14 fl. ounces.
Refined sugar	14 ounces.

Dissolve the sulphate of iron in one ounce of boiling water, and the phosphate of soda in two ounces of boiling water. Mix the solutions and wash the precipitated phosphate of iron until the washings are tasteless. With sufficient diluted sulphuric acid dissolve the sulphate of quinine in two ounces of water. Precipitate the quinia with solution of ammonia and carefully wash it. Dissolve the phosphate of iron and the quinia thus obtained, as also the strychnia in the dilute phosphoric acid; then add the sugar and dissolve the whole and mix without heat.

Each fluid drachm contains—

Phosphate of iron	1 grain.
Do. of quinia	1 grain.
Do. of strychnia	$\frac{1}{32}$ grain.

Dose, 1 to 1½ drachms.

OINTMENTS.

Unguentum Acidi Boracici.

Take of—

Boracic acid finely levigated ...	1 part.
White wax	1 part.
Paraffin	2 parts.
Almond oil	2 parts.

Melt wax and paraffin by heating them with the oil and stir the mixture briskly along with the acid in a warm mortar till the mass thickens, when cool, afterwards rub down successive portions in a cold mortar.

Unguentum Hydrargyri Perchloridi.

Take of—

Perchloride of mercury	8 grains.
Benzoated lard	4 ounces.

Mix.

Unguentum Conii Compositum.

Take of—

Extract of conium	60 grains.
Compound tincture of benzoin	3 fl. drachms.
Oil of turpentine	½ fl. drachm.
Simple ointment	1¼ ounces.

Mix.

Unguentum Cretæ.

Take of—

Prepared chalk	2 ounces.

Carbolic oil, a sufficiency to make the consistence of a thick paste.

Unguentum Hydrargyri Nitratis Mitius.

Take of—

Ointment of nitrate of mercury	60 grains.
Simple ointment	420 grains.

Mix.

Unguentum Olei Dipterocarpi.

Take of—

Gurjun oil	1 part.
Lime water	3 parts.

Mix.

Must be well rubbed together.

FOR CHILDREN.

The following formulæ are calculated for children one year old, unless otherwise stated.

Mistura Acidi Gallici cum Opio.

Take of—

Gallic acid	8 grains.
Tincture of cinnamon	1 fl. drachm.
Liquid extract of opium	8 minims.
Mucilage of gum	2 fl. drachms.

Cinnamon water	5 fl. drachms.
Water	to 2 fl. ounces.

Mix.

Dose, 1 to 2 drachms every six hours.

Two drachms contain—

Gallic acid	2 grains.
Liquid extract of opium	2 minims.

Mistura Alterativa.

Take of—

Syrup of the iodide of iron	6 minims.
Infusion of quassia	to 4 fl. ounces.

Dose, 1 to 2 drachms.

Mistura Hæmatoxyli.

Take of—

Tincture of catechu	2 fl. ounces.
Extract of logwood	1 ounce.
Carraway water	to 12 fl. ounces.

Mix.

Dose, ½ to 1 drachm.

Mistura Olei Ricini cum Opio.

Take of—

Castor oil	1 fl. drachm.
Powdered gum	32 grains.
Powdered sugar	32 grains.
Tincture of opium	4 minims.
Aniseed water	to 1 fl. ounce.

Mix.

Dose, 1 to 2 drachms.

One drachm contains—

Castor oil	7½ minims.
Gum	4 grains.
Sugar	4 grains.
Tincture of opium	½ minim.

Mistura Stimulans et Tonica.

(*Dr. Tanner.*)

Take of—

Carbonate of ammonia	32 grains.
Spirits of chloroform	1 fl. drachm.
Compound tincture of cinchona	4 fl. drachms.
Peppermint water to	to 8 fl. ounces.

Mix.

Dose, 2 to 4 drachms every six hours.

One drachm contains—

Carbonate of ammonia	½ grain.
Spirits of chloroform	1¼ minims,
Compound tincture of cinchona...	4 minims.

Pulvis Hydrargyri cum Ipecacuanha.

Take of—

Mercury and chalk	100 grains.
Ipecacuanha powdered	25 grains.
Dover's powder	50 grains.
Bicarbonate of soda	200 grains.

Mix.

Dose, 3 to 5 grains every fourth hour.

Pulvis Santonini cum Hygrargyri.

Take of—

Calomel	10 grains.
Santonine	20 grains.
Sugar, powdered...	60 grains.

Dose, 5 to 6 grains twice a day.

Pulvis Ipecacuanhæ et Potassæ Nitratis.

Take of—

Ipecacuanha in powder	10 grains.
Nitrate of potash	60 grains.
Dover's powder	5 grains.

Mix.

Dose, 3 to 4 grains every fourth hour.

Pulvis Quiniæ et Potassæ Chloratis.

Take of—

Chlorate of potash	40 grains.
Powdered ipecacuanha	10 grains.
Sulphate of quinine	20 grains.
White sugar, powdered	80 grains.

Mix.

Dose, 5 to 8 grains every fourth hour.

PART II.

DIRECTIONS FOR CARRYING OUT THE ANTISEPTIC METHOD OF DRESSING, ACCORDING TO THE PLAN OF PROFESSOR LISTER. BY J. MAITLAND, M. B.

Steam spray Apparatus.—As the success of this method depends primarily upon the efficiency of the spray apparatus, it is essential to keep the latter in the most perfect order. It must be constantly and carefully cleaned and oiled, and care must be taken that the valves, the cock, and the hinges of the spray tube work freely. Before commencing operations or dressings, the boiler, spirit lamp, and glass jar must be respectively filled or replenished. The apparatus must be placed in such a position that the spray may play freely upon the part to be operated upon, and all windows and doors likely to cause a draught must be closed, and the punkah must be stopped. Care must be taken that the arms or bodies of the operator or assistants do not intervene between the spray and the wound. In adjusting dressings, they must be folded down *towards* the spray, and the latter must be allowed to play upon the wound to the last moment. In removing dressings, one corner must, first cautiously, be raised whilst the spray is directed underneath it, and the dressings must be lifted *away* from the spray. If these precautions are not carefully attended to, the dressings may obstruct the spray, and allow the unpurified atmosphere to play upon the wound. In case of sudden failure of the spray apparatus, a large piece of gauze, called a "veil," soaked in a 1 to 40 solution of carbolic acid in water, should always be held in readiness to cover the wound.

Solutions of carbolic acid in water are required of the following strengths, viz. :—

(*a.*) Solution of 1 to 20, is used for "purifying the epidermis of the part about to be operated upon; for cleansing dirty instruments and sponges; and also for washing accidental wounds." It is also used for washing the hands of operator and assistants.

(*b.*) Solution of 1—30 is used for producing the spray.

(*c*) Solution of 1—40 is used for washing out wounds which are a septic, and healthy granulating surfaces.

Solutions of carbolic acid in oil are of two strengths, viz. :—

(*a*). Solution of 1 in 10 of olive oil is used for dressing cases in which the gauze dressing is not applicable, such as abscesses near the rectum, or those cases, in which there are many sinuses, and in which it is not possible to destroy all centres of putrefaction.

(*b*). Solution of 1 in 20 of olive oil is used for lubricating instruments introduced into the bladder or rectum.

Solution of chloride of zinc (40 *grs. to* 1 *oz. of water*), is used in cases where it is impossible to exclude causes of putrefaction from the wound, as in the mouth and perineum, or where sinuses exist. It is also used for cleansing the surface of ulcers before applying antiseptic dressings, and for purifying accidental wounds.

Drainage Tubes.—Drainage tubes varying in diameter from that of a crow-quill to that of the little finger, preserved in a 1 to 40 solution of carbolic acid. The holes must be half the diameter of the tube. In using the tubes, they must be cut to the exact depth of the wound. The inner end must reach the deepest part of the wound, and the outer end must be flush with the skin. Two pieces of silk ligature must be attached to the edge of the outer end of the tube and knotted at a distance of two inches from it. These threads must be laid straight upon the skin, one at each side of the wound. The outer end of the tube must always be at the most dependant point of the opening of the wound. If the tube has to be placed obliquely, the outer end must be cut obliquely so as to be perfectly flush with the skin. The tube should not be removed for three or four days unless it be obstructed. In large and deep wounds, three or four small tubes, side by side, are better than one large tube, and may be withdrawn one by one as the discharge lessens. In abscesses, the use of the tube must be continued until the cavity has completely closed, and in wounds it must be used as long as there is any oozing.

Sponges.—Besides the use of sponges for cleansing purposes, in cases where there is a large amount of discharge a sponge is placed over the wound and included in the dressings. All sponges must be wrung out with a 1 to 20 solution of carbolic acid.

Protective.—The protective is placed in immediate contact with the wound. It should be large enough to cover the wound, no more. Before use, it must be dipped in a 1 to 40 solution of carbolic acid.

Antiseptic gauze.—In general the gauze is employed in eight layers. In cases where there is not much extent of skin to overlap, as in herniotomy, or other operations about the pubes and groin, sixteen or more layers must be used, and loose pieces must be packed round the wound as well. In cases where there is likely to be much discharge, spare pieces, crumpled up loosely, must be used in addition to the layers. The gauze dressing should overlap the wound at least nine inches in every direction. In the case of the limbs it should surround the whole limb and overlap. A piece of gauze soaked in a 1 to 40 solution of carbolic acid must be applied over the protective before applying the dry gauze dressing.

Mackintosh.—A layer of Mackintosh is placed between the two outer layers of gauze. It should be slightlysmaller than the gauze dressing, and when more than one dressing is used, (called a " compound dressing") care must be taken that none of the Mackintosh projects uncovered in the vicinity of the wound. The same piece of Mackintosh may be used over again if carefully washed in a 1 to 20 solution of carbolic acid, and as long as it remains *perfectly waterproof.*

Catgut ligature.—Carbolised catgut of varying thickness is used for ligaturing vessels and for deep sutures. The ends of ligatures and sutures are cut short.

Boracic lotion, boracic lint, boracic ointment.— Boracic lint is used for dressing ulcers and abrasions.

Boracic lotion and lint are the best form of dressing after operations on the penis. Boracic ointment is used as a dressing in ulceration and wounds of the lips, cheeks, and nose.

The Boracic acid dressings should be substituted for carbolic acid, when the latter produces symptoms of poisoning. Boracic lotion is a saturated solution of boracic acid in boiling water. For boracic lint and ointment, *vide* Formula.

General directions.—Careful attention to *every detail* is essential to the success of the antiseptic method. Omission of the smallest detail or any slovenliness or slurring over must inevitably result in failure, and may cause the death of the patient.

Operations.—The spray being in position as directed, the skin of the part to be operated upon must be carefully washed with a 1 to 20 solution of carbolic acid. So also the hands of the operator and assistants. A tray containing a 1 to 20 carbolic solution must be placed beside the operator, and all instruments must be emersed in it. After setting aside any instrument, it must be carefully washed in the 1 to 20 solution before being again used.

As regards re-dressing, this is usually done twenty-four hours after the operation. As the serous discharge decreases in quantity, the dressings may be left longer; from two days to a week. If there is much oozing, the dressings may have to be renewed two or three times in the first twenty-four hours. If discharge appear at the margin of the dressings, they must be renewed at once.

In re-dressing wounds, they must be lightly washed out a 1 to 40 carbolic solution.

Recent accidental wounds, must be carefully cleansed from all impurities with a 1 to 20 carbolic solution and afterwards carefully syringed out with the chloride of zinc solution. This must be done under the spray, and the further treatment must be similar to cases of operation. If however the wound become septic, the spray and gauze dressing must be abandoned, and boracic lint and lotion substituted.

Excisions and removal of dead bone.—In these cases where there are sinuses, the latter must be laid open and syringed out with the chloride of zinc solution. The wound must be dressed with carbolic oil and lint and this must be renewed every three hours, until all smell has disappeared.

Ulcers.—The surface of the ulcer must first be treated with chloride of zinc solution, and the surrounding skin purified with 1 to 20 carbolic solution. The sore is then covered with a piece of protective which should slightly overlap its edges. Over this is placed a piece of boracic lint large enough to extend an inch or more beyond the protective. Over all is placed a gauze bandage and the dressing may be left for two or three days according to the amount of discharge.

Skin-grafting.—Similar dressing to the last may be used, each little piece of epidermis being covered by a separate piece of protective.

In operations on the penis, such as circumcision, and amputation, the boracic dressing should be applied as follows :—A piece of boracic lint soaked in boracic lotion is wound round the organ leaving the orifice of the urethera free. Over the whole is laid a loose piece of boracic lint covered with gutta-percha tissue. When the patient wishes to urinate, the loose apron of lint is raised, and when micturition is completed, boracic lotion is poured freely over the part, and the apron of lint reapplied.

After operations on the face.—The wound should be dressed with a piece of linen spread with boracic ointment. The edges of the dressing must be fixed with collodion.

PART III.

RULES REGARDING DIET AND EXTRAS.

HOSPITAL RULES, SECTION VII.

(*a.*) The dinners are invariably to be served in the presence of the Stewards.—*Para.* 4.

(*b.*) The meals are to be served at the following hours :—

Early tea	6 A.M.
Breakfast	10 A.M.
Dinner	2 P.M.
Tea	6 P.M.

(*c.*) The tea will be infused (not boiled) in the kitchen in the presence of one of the Stewards, and the tea-cauldrons are not to be used for any other purpose. Each so-called pint of tea to consist of thirteen ounces inclusive of the milk.—*Para.* 5.

(*d.*) The Steward, or one of his Assistants, will daily superintend the milking of the cows, a memo will be sent round with the milk for the patients which the Nurse will initial. Each pint of milk is to measure twenty ounces.—*Para.* 8.

(*e.*) All extra broths are to be given out at noon except when specially ordered for another hour. Each so-called pint of broth to consist of sixteen ounces.—*Para.* 15.

(*f.*) The extra conjees are to be given out at 7 A.M. Each so-called pint to consist of ten ounces.—*Para.* 16.

(*g.*) All wines ordered for patients are to be sent to the Nurses in charge of the wards in bottles corked and labelled. They are all to be given out before noon.—*Para.* 18.

(*h.*) All special orders regarding the cooking of diets or extras must be entered on the diet-sheets.

(*i.*) All "uncontracted articles" require special sanction of the Surgeon-General.

(*j.*) For diets into which meat enters, black pepper will be issued at the rate of one ounce for forty-eight diets, or one-third of a drachm for each diet.—*Medl. Code, Sect. XII, Para.* 10*f*.

(*k*.) Spice powder for flavouring puddings, sago, arrowroot, &c., in the proportion of from 10 to 15 grains for each is allowed. Spice powder consists of ginger 5½ parts, cinnamon one, nutmeg one, and cloves one part to be well ground and mixed and put into tin boxes holding from two to four ounces.—*Medl. Code, Sect. XII, Para.* 10*e*.

(*l*.) A diet is not to be made up of extras alone.—*Hospital order, 16th March* 1881.

(*m*.) When a Medical Officer wishes to order conjee in the morning for a native patient on full diet, he will mark it, Full and C. Two ounces of rice and salt will be deducted from the allowance and prepared as conjee.—*Hospital order,* 16*th March* 1881.

(*n*.) Arrack is the only spirit which may be issued to natives without special explanation.—*Hospital order, 9th May* 1882.

TABLE OF DIETS FOR EUROPEAN AND EAST INDIAN PATIENTS IN THE GENERAL AND OTHER CIVIL HOSPITALS AT MADRAS, LUNATIC ASYLUM, LEPER AND LOCK HOSPITALS EXCEPTED.

ARTICLES COMPRISING THE DIFFERENT HEADS OF DIET FOR A DAY.

Avoirdupois Weight.

Spoon.	Milk.	Half.	Mixed.	Full.
Sago 2 oz. Tea ½ ,, Sugar 2¼ ,, Milk 6 ,, Rice 2 oz. Salt 2 drs. } For conjee-water.	Bread 12 oz. Rice 3 ,, including 1 oz. for conjee-water. Milk 2 pts. and 6 oz. for Tea. Butter ½ oz. Sugar 2¼ ,, including ¾ oz. for Tea. Tea ½ oz. Salt 2 drs. Soojee 4 oz. in lieu of Rice at the discretion of the Medical Officer	Chicken 8 oz. or* Mutton 10 ,, Bread 1 lb. Potatoes 8 oz. Tea ½ ,, Sugar 1½ ,, Milk 6 ,, Butter 1 ,, Onions 1 ,, Barley ½ ,, Flour ½ ,, Salt 6 drs. The Mutton may be roasted or grilled. In such cases the requisite quantity of Ghee may be used, and the Barley, Onions, and Flour excluded.	Coffee. 1¼ oz. Hoppers 6* No. Mutton for curry 8 oz. Rice 8 ,, Curry Powder ½ ,, Sugar 1½ ,, Milk 6 ,, Butter 1 ,, Bread 8 ,, Country Vegetables 4 oz. Salt 1 ,, Tamarind ½ ,, * "Hoppers" to weigh two ounces each when cooked	Meat, either Beef or Mutton 12 oz. Bread 1 lb. Potatoes 12 oz. Tea ½ ,, Sugar 1½ ,, Milk 6 ,, Butter 1 ,, Onions 1 ,, Barley ½ ,, Flour ½ ,, Salt 6 drs. *N.B.*—In this diet the Meat may be roasted or broiled. In such cases the Diet to be marked "Full varied," and Butter or Ghee 1 oz. to be allowed, and Onions, Barley, and Flour to be excluded.

Nutrative value as shown by the Nitrogen and Carbon contained in each Diet.

Nitrogen, grains 23·5 Carbon, grains 1,307·6	Milk Diet with Rice. Nitrogen, grains 203·1 Carbon, grains 4,091·3 Milk Diet with Soojee. Nitrogen, grains 223 Carbon, grains 4,239·3	Half Diet with Chicken. Nitrogen, grains 237·2 Carbon, grains 2,760·8 Half Diet with Mutton. Nitrogen, grains 224·7 Carbon, grains 3,904·8	Nitrogen, grains 189·9 Carbon, grains 4,569·5	Nitrogen, grains 249·45 Carbon, grains 4,228·8

BREAKFAST.

Spoon.	Milk.	Half.	Mixed.	Full.
Tea 1 pint.	Tea 1 pint.	Tea 1 pint.	Coffee 1 pint.	Tea 1 pint.
Sugar ¾ oz.	Milk 1 ,,	Bread 6 oz.	Hoppers 6 No.	Bread 6 oz.
Milk 3 ,,	Bread 4 oz.	Butter ½ ,,	Butter ½ oz	Butter ½ ,,
	Sugar ¾ ,,			

DINNER.

Spoon.	Milk.	Half.	Mixed.	Full.
Sago in Jelly 2 oz.	Rice 2 oz. Milk 1 pt. Bread 4 oz. Sugar ¾ ,, Soojee 4 ,, } In Rice Milk. in lieu of Rice.	Mutton in Broth 1 pt. or Meat roasted or fried 10 oz.	Rice 8 oz.	Broth or Soup 1 pt. or Meat roasted 12 oz.
Sugar ¾ ,,		Bread 4 ,,	Mutton for curry 8 ,,	Bread 4 ,,
		Potatoes 8 ,,	Vegetables 4 ,,	Potatoes 12 ,,
			Bread 2 ,,	

SUPPER.

Spoon.	Milk.	Half.	Mixed.	Full.
Tea 1 pint.	Tea 1 pint.	Tea 1 pint.	Coffee 1 pint.	Tea 1 pint.
Sugar ¾ oz.	Bread 4 oz.	Bread 6 oz.	Bread 6 oz.	Bread 6 oz.
Milk 3 ,,	Butter ½ ,,	Butter ½ ,,	Butter ½ ,,	Butter ½ ,,

* At the discretion of the Medical Officer.

N.B.—The Meat for the various Diets must weigh in the raw state, exclusive of bone, the weights specified in the Table. An addition at the rate of one-fourth of a pound more will be considered an equivalent when Meat is issued with bone.

The number of Diets carried during the month should be shown in a note at the foot of the Monthly Statement.

Wines and Spirits and Eggs may be prescribed in addition to any of the Diets as the Surgeon in charge may deem necessary.

Extras will only be allowed on Spoon and Milk Diets.

Infant Diets for the Lying-in-Hospital and Hospital for Women and Children.—At the discretion of the Medical Officer according to old "Diet Scale."

TABLE OF DIETS FOR NATIVE PATIENTS IN THE GENERAL AND OTHER CIVIL HOSPITALS IN MADRAS, LUNATIC ASYLUM, LEPER, LOCK AND LYING-IN-HOSPITALS EXCEPTED.

ARTICLES COMPRISING THE DIFFERENT HEADS OF DIET FOR A DAY.

Avoirdupois Weight.

Spoon.		Milk.		Low.		Full.	
Sago	4 oz.	Bread	12 oz.	Mutton in broth	6 oz.	Mutton for curry	8 oz.
Sugar	2 ,,	or		Bread	12 ,,	Rice	8 ,,
Milk	6 ,,	Rice	12 ,,	Ghee or Butter	1 ,,	Curry Powder	½ ,,
Rice For conjee-water	2 ,,	Milk	2 pints	Onions	1 ,,	Country Vegetables	4 ,,
Salt	2 drs.	Sugar	2 oz.	Barley	¼ ,,	Hoppers	6 No.*
		Rice For conjee-water	2 ,,	Flour	½ ,,	Bread †	8 oz.
		Salt	2 drs.	Salt	1 ,,	Butter or Ghee	1 ,,
						Salt	1 ,,
						Tamarind	½ ,,
						Dholl, three times a week	2 ,,

Nutrative value as shown by the Nitrogen and Carbon contained in each Diet.

		Milk and Bread.				Full Diet with Bread.	
Nitrogen, grains	23·5	Nitrogen, grains	183	Nitrogen, grains	136·8	Nitrogen, grains	173·4
Carbon, grains	1,610·8	Carbon, grains	3,386	Carbon, grains	2,315·5	Carbon, grains	4,104·2
		Milk and Rice.				with Dholl.	
		Nitrogen, grains	159			Nitrogen, grains	203·4
		Carbon, grains	4,070			Carbon, grains	4,426·2
						Full Diet with Rice.	
						Nitrogen, grains	157·4
						Carbon, grains	4,560·2
						with Dholl.	
						Nitrogen, grains	187·4
						Carbon, grains	4,882·2

BREAKFAST.

Spoon.		Milk.		Low.		Full.	
Sago	1 oz.	Bread or Rice	4 oz.	Bread	4 oz.	Hoppers	6 No.
Sugar	½ ,,	Milk	½ pt.	Ghee or Butter	½ ,,	Butter	½ oz.
		Sugar	1 oz.				

DINNER.

Spoon.	Milk.	Low.	Full.
Sago ... ... 2 oz. Sugar ... ... 1 ,, Milk ... ... 6 ,,	Bread or Rice ... 8 oz. Milk ... ... 1 pt. Sugar ... ... 1 oz.	Mutton in broth ... 6 oz. Bread ... 4 ,,	Mutton for curry ... 8 oz. Vegetables ... 4 ,, Rice ... ... 8 ,,

SUPPER.

Spoon.	Milk.	Low.	Full.
Sago ... ... 1 oz. Sugar ... ... ½ ,,	Milk... ... ½ pint.	Bread ... 4 oz. Ghee or Butter ... ¼ ,,	Bread ... 8 oz. Butter or Ghee ... ¼ ,,

* Hoppers to weigh 2 oz. each when cooked. † Or Rice 1 lb. omitting Bread.

The weight of Meat in the above Diets to be exclusive of bones.

In cases in which the Medical Officer considers it necessary Tea ¼ oz. or Coffee 1¼ oz. per diem may be ordered with any of the above Diets except Full; when given with Low Sugar 1½ oz. and Milk 6 oz. will also be allowed.

Extras, except Eggs and Arrack are only to be given on Spoon and Milk Diets.

NOMENCLATURE OF DIETS AND EXTRAS IN USE IN THE HOSPITAL.

NATIVE DIETS.

Full { with bone.
with coffee.
with rice.
Low { with conjee.

Milk { with bread.
with rice.
Spoon.

NATIVE EXTRAS.

Arrowroot conjee.
Bread.
Butter.
Beef tea.
Barley water.
Bran biscuits.
Chicken broth.
Chutney.
Coffee with milk.
Conjee water.
Curry, mutton.
Curry, chicken.
Curry, vegetable.

Eggs.
Extract of beef "Liebigs"
Ginger tea.
Hoppers.
Ice.
Limes.
Mutton broth.
Do. chops.
Do. cutlets.
Milk.
Oranges.
Plantains.
Pepperwater.

Native Extras—(*continued.*)

Rice.
Raw beef.
Sago conjee.
 Do. jelly.
Soojee conjee.
Sugar.
Tea with milk.

Wines and Spirits.

Arrack.
Brandy.
Gin.
Port wine.

European Diets.

Spoon.
Half
- with chicken.
- with mutton.

Milk
- with soojee.
- with rice.

Mixed.
Full without bone, or varied.

European Extras.

Arrowroot conjee.
Arrowroot jelly.
Barley water.
Beef tea.
Beef tea jugged.
Bran biscuits.
Bread.
Bread pudding.
Butter.
Blancmânge.
Chicken broth.
 Do. curry.
 Do. cutlets.
 Do. grilled.
 Do. jelly.
 Do. pepper-water.
 Do. roast.
Coffee with milk.
Conjee water.
Cornflour conjee.
Country lemonade.
Custard pudding.
Eggs.
Extract of beef "Liebigs"
Fish.
Ginger tea.
Hoppers.
Ice.
Lemonade.
Limes.
Milk.
Mutton broth.
 Do. chops.
 Do. curry.
 Do. cutlets.
 Do. minced.
 Do. pepper-water.
Oranges.
Partridge roast.
Pigeon roast.
Plantains.
Potatoes.
Raw beef.
Rice.
Rice pudding.
Sago conjee.
 Do. jelly.
 Do. pudding.
Sheep-feet jelly.
Sodawater.
Soojee conjee.
Sugar.
Tea with milk.
Vegetables.

Wines and Spirits.

Arrack.
Beer.
Brandy.
Claret.
Gin.
Porter.
Port wine.
Sherry.
Whisky.

FORMULÆ OF EXTRAS.

Arrowroot Conjee—1 Pint.

Arrowroot	½ ounce.
Sugar	½ ounce.

Arrowroot Jelly—1 Pint.

Arrowroot	2½ ounces.
Sugar	½ ounce.
Milk	2 ounces.

Barley Water—1 Pint.

Barley	2 ounces.
Sugar	2 ounces.

Beef Tea—1 Pint.

Beef	12 ounces.
Salt	½ ounce.
Pepper	2 ounces.
Spice	1 ounce.

Blancmánge ¼ lb.

Gelatine	1 ounce.
Sugar	1 ounce.
Lime	one.
Ice	½ pound.
Milk	1 pint.

Bran Biscuits—1 lb.

Bran	16 ounces.
Salt	1 ounce.

Bread Pudding.

Bread	4 ounces.
Sugar	1 ounce.
Eggs	two.
Milk	15 ounces.

Chicken Broth—1 Pint.

Chicken	one.
Onions	1 ounce.
Barley	2½ ounces.
Salt	120 grains.
Pepper	60 grains.
Mint and Parsley.	120 grains.

Chicken Curry.

Chicken of 10 ounces	one.
Ghee	1 ounce.
Curry powder	½ ounce.
Tamarind	½ ounce.
Onions	½ ounce.
Salt	¼ ounce.

Chicken Cutlets.

Chicken	one.
Ghee	90 grains.
Salt	120 grains.
Onions	60 grains.

Chicken Grilled.

Chicken	one.
Ghee	1 ounce.
Salt	120 grains.
Pepper	60 grains.

Chicken Jelly—8 Ounces.

Chicken	two.
Sugar	3 ounces.
Limes	four.
Eggs	two.
Spice	120 grains.
Ice	1 pound.

FORMULÆ OF EXTRAS—(*continued.*)

Chicken-Pepperwater—1 *Pint.*

Chicken ...	one.
Curry-powder ...	½ ounce.
Ghee	½ ounce.
Onions	1 ounce.
Salt	120 grains.
Limes	one.

Chicken Roast.

Chicken of 10 ozs.	one.
Ghee	1 ounce.
Pepper	60 grains.
Salt	¼ ounce.

Chutney—1 *Ounce.*

Tamarind ...	¼ ounce.
Green Chillies ...	¼ ounce.
Mint, Coriander, and ginger, green.	½ ounce.
Salt	2 drachs.

Coffee—1 *Pint.*

Coffee powder ...	½ ounce.
Sugar	½ ounce.
Milk	2 ounces.

Conjee-water—1 *Pint.*

Rice	2 ounces.
Salt	120 grains.

Cornflour Conjee—1 *Pint.*

Cornflour ...	½ ounce.
Sugar	½ ounce.

Curry-paste for a European Mixed Diet.

Mutton 8 ounces and Vegetables 4 ounces.

Chillies. ...	⅛ ounce.
Coriander seeds.	¼ ounce.
Turmeric ...	¼ ounce.
Mustard ...	⅛ ounce.
Cummin seeds.	⅛ ounce.
Vendiam ...	⅛ ounce.
Pepper	⅛ ounce.

Curry-paste, &c.—(*contd.*)

Garlic	⅛ ounce.
Tamarind ...	¼ ounce.
Onions	1 ounce.
Ghee	1 ounce.

Curry-powder—15 *lbs.*

Chillies ...	2½ pounds.
Black pepper ...	1½ pounds.
Coriander ...	3 pounds.
Turmeric ...	2 pounds.
Cummin seed ...	1¾ pounds.
Mustard ...	2 pounds.
Vendiam ...	1¾ pounds.
Garlic	½ pound.

½ oz. for each Native full diet.

Custard Pudding.

Milk	1 pint.
Sugar	1 ounce.
Eggs	two.
Spice	60 grains.

Ginger Tea—1 *Pint.*

Ginger	¼ ounce.
Sugar	½ ounce.
Milk	2 ounces.

Jugged Beef Tea—1 *Pint.*

Beef	12 ounces.
Salt	120 grains.
Pepper	120 grains.
Water	30 ounces.

To be jugged for 2 hours.

Lemonade, Country—1 *Pint.*

Limes	two.
Sugar	¾ ounce.

Mutton Broth—1 *Pint.*

Mutton with bone.	12 ounces.
Barley	½ ounce.
Onions	1 ounce.
Mint & Parsley.	120 grains.
Pepper ...	60 grains.
Salt	120 grains.

FORMULÆ OF EXTRAS—(*continued.*)

Mutton Chops—1 lb.

Mutton	1 pound.
Ghee	2 ounces.
Pepper	60 grains.
Salt	60 grains.

Mutton Curry—½ lb.

Mutton	8 ounces.
Ghee	1 ounce.
Curry powder	½ ounce.
Tamarind	½ ounce.
Onions	½ ounce.
Salt	½ ounce.

Mutton Cutlets—½ lb.

Mutton	8 ounces.
Salt	120 grains.
Ghee	2 ounces.
Onions	1 ounce.
Pepper	60 grains.
Mint & Parsley.	120 grains.

Partridge Roast.

Partridge	one.
Ghee	1 ounce.
Pepper	60 grains.
Salt	¼ ounce.

Pepper-water—1 Pint.

Chilly	¼ ounce.
Pepper	¼ ounce.
Garlic	2 drachs.
Tamarind	½ ounce.
Salt	3 drachs.

Pigeon Roast.

Pigeon	one.
Ghee	1 ounce.
Pepper	60 grains.
Salt	¼ ounce.

Raw Beef Juice.

Beef	1 pound.
Hydrochloric acid	40 drops.
Salt	¾ ounce.

Rice Pudding.

Rice	2 ounces.
Sugar	1 ounce.
Milk	15 ounces.
Eggs	two.

Sago Conjee—1 Pint.

Sago	½ ounce.
Sugar	½ ounce.

Sago Jelly—1 Pint.

Sago	2 ounces.
Sugar	½ ounce.
Milk	2 ounces.

Sago Pudding.

Sago	2 ounces.
Sugar	1 ounce.
Eggs	two.
Milk	15 ounces.

Sheep-feet Jelly—½ lb.

Sheep-feet	eight.
Water	2 pints.
Sugar	3 ounces.
Limes	three.
Eggs	two.
Cinnamon	120 grains.
Cloves	one.
Sherry	1½ ounce.
Ice	1 pound.

Soojee Conjee—1 Pint.

Soojee	½ ounce.
Sugar	½ ounce.

Tea—1 Pint.

Tea	¼ ounce.
Sugar	½ ounce.
Milk	2 ounces.

Vegetable Curry—4 Ounces.

Vegetables	4 ounces.
Curry powder	¼ ounce.
Tamarind	¼ ounce.
Onions	¼ ounce.
Salt	¼ ounce.

The following table copied from the Madras Manual of Hygiene gives the number of grains of nitrogen and carbon contained in one pound of the following articles of food :—

—	Nitrogen in grains.	Carbon in grains.	—	Nitrogen in grains.	Carbon in grains.
Bacon dry	95	5,987	Herrings (red)	217	1,435
Do. green	76	5,426	Maize meal.................	120	3,016
Barley meal.................	68	2,563	Malt liquor	1	274
Do. pearl	91	2,660	Milk, new	44	599
Beef, cooked	304	1,854	Do. skimmed	43	438
Do. fat uncooked	154	1,578	Mutton, cooked...........	304	1,883
Do. ordinary	184	1,024	Oatmeal	136	2,831
Biscuit	363	2,928	Parsnips	12	554
Bread, average	88	1,975	Peas (split) dhál	248	2,699
Bullock's liver	204	934	Pork (fat)	106	4,113
Butter........................	0·2	6,456	Potatoes	22	769
Buttermilk..................	44	387	Rice	68	2,732
Butter........................	0·2	6,456	Sago..........................	13	2,555
Carrots	14	508	Sugar	...	2,955
Cheese, chedder	306	3,344	Turnips	13	263
Cheese, skim milk	483	1,947	Vegetables (green)	14	420
Cocoa	140	3,934	Wheat flour (seconds)...	116	2,700
Egg	149	1,144	Whey	13	154
Fish, white	195	871			

The following quantities of each of the alimentary groups and of the nitrogen and carbon are necessary for maintaining in health an adult man under moderate labor. (Moleschott.)

Albuminates	4·4 ounces.
Carbo hydrates...	14 ounces.
Fat	2·75 ounces.
Salts	437 grains.

Total water-free food equals twenty-two ounces, or

Nitrogen	300 grains.
Carbon	5,000 grains.

At pages 97 and 99 of the Manual it is stated that the following quantities of nitrogen and carbon are sufficient to keep a man in health while in a state of idleness of mind and body.

Nitrogen	200 grains.
Carbon	3,500 grains

and that 138 nitrogen grains per diem are required to carry on the necessary physiological work of the body. All these calculations were made for Europeans in their own climate.

ALCOHOL TABLE.

The weight of Absolute Alcohol (sp. gr. 796 at 68° F.) and of Carbon in measured quantities of spirituous liquors.

Spirituous Liquors.	1 oz. Avoir. Abs. Alcohol is contained in fluid ounces.	1 oz. Avoir. Carbon is contained in fluid ounces.
ARDENT SPIRITS.		
Proof spirit	2·26	4·3
Whisky	2·6	5·0
Brandy	2·7	5·0
Rum	2·8	5·3
Arrack	3·0	5·8
Gin	3·2	5·5
WINES.		
Sherry	6·6	10·2
Cape Madeira	6 8	11·0
Port	6·9	10·2
Marsala	7·5	11·7
Champagne	12·6	11·3
Hock	13·4	20·4
Hungarian Red Voslau	14·1	21·2
Burgundy	15·2	23·8
Moselle	15·2	23·3
Claret	16·3	23·4
Sauterne	19·0	27·2
Hungarian White Neszwely	19·0	28·8
Cider	64·0	40·0
MALT LIQUORS.		
Ale, Burton, Bass, ◈ 84/	12·5	9·0
,, ,, ,, ◈ 60/	14·2	13·0
,, Pale, ,, ◈ 0/	19·0	17·5
,, India (Gardner, × 54/)	23·0	28·0
,, Bottled { Scotch (Edinb.)	19·0	13·1
{ Pale	25·0	20·5
,, ,, Eight penny	22·7	22·2
,, Family 1/ gall.	24·9	22·0
,, ,, Four penny	25 4	23·0
Stout, Dublin bottled	28·8	16·7
,, London	21·5	18·9
Porter, London	35·6	26·6

(DOBEE'S *Diet and Regimen.*)

As a rule the average allowance of absolute alcohol taken by a healthy adult man in twenty-four hours should not exceed from one ounce to one-and-a-half ounces, in whatever shape it is taken. (Anstie. *Practitioner,* vol. 3, p. 37.)

PART IV.

HINTS ON THE CLINICAL EXAMINATION OF PATIENTS.

CHAPTER I.

SUGGESTIONS REGARDING CLINICAL STUDY.

A few words on the general question of clinical study will, I hope, help the student to understand the system he commences to work under, and to appreciate the hints which I have compiled from very various sources on the subject of the observation of disease. Every student attending the Madras College is supposed to have a year's preliminary training at least, either in the up-country hospitals, in the out-patient department, or Surgical Wards of the General Hospital before he is permitted to commence regular "case taking" in the wards. During this period he has much to learn. I may here repeat the advice of one of our greatest teachers,* "Use your observation to the utmost, be continually in the wards looking at the sick and asking them questions, be inquisitive about the effects of medicines, be listening perpetually with your bare ears or with the help of the stethescope at the chest, that you may become familiar with the sounds of healthy respiration and the healthy contraction of the heart, and then try to use the same means for the detection of disease. Accustom yourselves to feel the pulse, the number of the beats is easily measured, but it has qualities which are referable only to the sensation of him who feels it, and you must educate your touch to the discrimination of them, for these qualities, much more than its mere number, secure to guide us in the detection of disease and the method of treating it. The tongue too must be often looked at before you will be able to detect upon it the marks which are morbid. There are certain secretions also, the different morbid qualities of which you must learn by frequent examination; the expectoration, the urine, both have qualities upon which may depend the diagnosis of disease and the choice of remedies. These are a few cardinal points with which habit must render you familiar, and enable you to appreciate the information they are calculated to convey, before you can take cases for yourselves with any prospect of advantage."

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* Dr. Latham.

"Let me also mention the Physiognomy of disease. This can never be adequately described, and I urge you always to remark it, and to dwell much on it, for some acute observers have drawn such secrets from the expression of the countenance, that it has been to them in the place of almost all other symptoms."

I would only add to this regarding the work you should do in the out-patient department and in the Surgical Wards; now, is the time you should learn to bandage neatly and well, learn the uses of the different kinds of bandages, and how to apply them; learn the use of all the different Surgical dressings you see applied, and how to apply them yourselves with cleanliness, neatness, and care. Learn the names, and uses, of all the sounds, and specula the Surgical instruments, and especially of those in the surgeon's pocket case. Whenever you see a new Surgical appliance in use, be sure you find out what it is for, and how it is to be applied. Now is the best time to commence training your sense of touch, and sight. Never let any opportunity pass you of feeling a tumor, or seeking for fluctuation, of handling a fractured, or dislocated limb; train your eye to know at once the normal appearance of the healthy body, learn all the "Surgical landmarks;" acquaint yourself with the names, composition, and nutritive values of all the hospital diets, and extras, so that when you commence the more important duty of "case taking," you will be able to understand the principles on which diets, and extras, are ordered.

Lastly, you should learn the use of the microscope, there is no vast difficulty about it, and I hope the chapter on its use will make it clear to you that all it requires is a little time, and patience, to enable you to manipulate it, so that it will help you at clinical work.

The students who have passed through their preliminary year are permitted to take cases, and will learn from them in proportion to the extent they have carried out the above suggestions, and acquired facts in the anatomical, physiological, and chemical classes, which they have attended or are attending.

It is in the Wards of an hospital that the *art* of the profession can be learnt, all your other studies are to enable you to practice this art, and in proportion to the way you learn to apply the facts you have acquired in your different classes to the accurate observation of disease you will be successful clinical students. By the hospital rules the clinical clerks are required to help the assistant clinical clerks in the taking of their cases, and may be a very great assistance to them, if it is given willingly. The case has to be read out to the visiting Medical Officer who, corrects any errors, finds out from the clinical clerk what he considers the case to be, what would be his treatment, and what is the probable result. These points the clerk should have settled in his own mind beforehand, and be able to give his reasons. The case should then be transcribed into the clerk's journal with full records of the diet and treatment, submitted through the clinical clerk for corrections, who hands it to the clinical teacher for final correction before it is copied into the hospital journal. The case books of the clinical clerks are handed in direct.

The first impression of a clinical student in an hospital is that his task is an impossible one. Dr. Latham thus graphically describes his feelings: "The scene bewildered me, and I learnt nothing for months. It was something, however, to become reconciled to the objects around me, and to look with complacency on what was going on. All I saw was "a great multitude of impotent folk" and the physicians busy among them with the expedients of their art. And some were recovering, and some dying; some getting better, and some worse, and some remaining unalterably the same. The physicians and their art confronted the patients and their diseases, and exercised, I plainly perceived, a great power upon the whole."

When you have got beyond this stage, you will be able to commence case taking with advantage. The habit you acquire as a student of observing disease, like all habits, tends to stick to you through life, and if you acquire accuracy of observation it will be invaluable to you. The first thing you have to do, is to gain the confidence of your patient; this can only be done by calmness, delicacy, sympathy, patience, and kindness. The patient is often nervous, timid, embarrassed, deaf, or the state of his health may interfere with his giving clear answers to your questions. In Southern India, the natives are particularly nervous, and often make false assertions, with regard to the duration of their illnesses on account of the mistaken belief they have, that if their disease is chronic, we will do nothing for them. You can only get over these difficulties by gaining their confidence.

Before asking any questions you should observe the expression, whether the complexion is florid, pale, or dusky, in natives the tint of the skin changes and loses its glossy appearance; note the general bulk of the body, whether well nourished, or wasted, whether there are any local swellings, atrophies, or eruptions; note the power of locomotion, and the free use or otherwise of the limbs; also form your first impressions of their vital powers—all this you soon learn to do at a glance, and then you proceed to observe the case according to the rules laid down further on. I find it always best to examine my cases first thoroughly, diagnose, if possible what is the matter with them, and then sit down to record the description of the case, with its signs, and symptoms, followed by the history, diet, and treatment. It takes long and careful practice before a student can record a case so that it is a real "picture in words," such as any physician reading it, would be able to say at once, what the case had been. One great fault I have seen in the cases recorded in the General Hospital is that many of the students get into the habit of recording their cases in a routine manner so that numbers of the cases appear the same when re-read. It is not so in reality, every case of disease differs as much as the sufferers themselves differ, and the student should acquire the habit of describing each case as it existed. Lord Bacon, in advocating the writing of narratives of cases which he points out is as old as the time of Hippocrates, says, "Nor get to exclude all but prodigies, and wonders, as several have done, for many things are new in their manner and circumstances, which are not new in their kind; and he who looks attentively, will find many particulars worthy of observation in what seems vulgar."

Latham says when writing of books for students to read, "They only who are practically informed can read good books with profit, or bad books without injury."

The different Manuals you are supplied with from the College will be very valuable to you, but you must remember that they do not describe disease, as it exists, they have been happily compared to "maps" of a country, and used as such they will be useful. Your plan is to study the case as it is corrected by your clinical teacher, read up the subject at the same time in your manual, and when you meet with any difficulties do not fear to ask your teacher. You may also learn much by conversation on such subjects with students who have studied them.

If the student records his cases carefully, and fully, his hospital case book will always be of use to him in after life for reference, still more so, if he records an accurate commentary at the end of each case.

Lastly, a few words on the duties of the post-mortem clerks. If you neglect your opportunities now you may never have the same chance again of seeing post-mortem demonstrated, or acquiring the necessary dexterity, and system. In every case that it is possible you should endeavour to confirm the accuracy of the diagnosis, and of your observations of the physical signs during life. It is in the post-mortem room, you often learn modesty with reference to your powers of diagnosis. Every case you examine will teach you something new of the variations found in diseased structures. It is a necessary preparation for the medico-legal examinations which every medical man in this country may be called upon to make. The post-mortem room is also an admirable place to acquire dexterity in passing catheters, in drawing teeth, in passing the œsophageal tube, and in handling the knife generally.

CHAPTER II.

DISEASE.

HOW MODIFIED. DEFINITION. DIAGNOSIS. SYMPTOMOLOGY. PROGNOSIS.

There are certain differences between man and man which modify all disease; these are either *original*, or *acquired*. The *original*, include those due to temperament, diathesis, hereditary predisposition, race, idiosyncrasy, and also those due to sex, and age. The *acquired* differences, are due to air, and climate, place of abode, supplies of food, and water, clothing, habits, occupation, mode of life, and also those due to diseases latent in the system.

Temperament.—The term is a useful one as it gives a good generalization though it wants in accuracy. The temperaments of people differ in kind, the differences corresponding to peculiarities of external form. The temperaments have been divided into the *sanguine*, *phlegmatic*, *bilious*, *nervous*, and *mixed*.

In a European of *sanguine* temperament, we see moderate plumpness, firmness of flesh, hair red or light chestnut, eyes blue, complexion fair or florid, skin soft, circulation active, pulse full and frequent, countenance animated, movements quick, passions excitable, mind volatile and unsteady.

In a *phlegmatic* or *lymphatic* European, we see roundness of form, softness of flesh, hair fair, eyes blue, grey, or hazel, skin pale, lips large, face wanting in character and expression, circulation languid, pulse slow, all the functions bodily and mental are torpid.

In the European of *bilious* temperament, we see firmness of flesh, harshness of outline, strongly marked and expressive features, hair and eyes are dark brown, or black, complexion swarthy, superficial veins prominent, pulse full, moderately frequent, much energy of character, great power of endurance, physical and mental, permanence of impressions. If the mind is unusually serious and sad, it is called the *melancholic* temperament.

A European of *nervous* temperament is of a small spare form, soft and slender muscles, features delicate, hair fair, complexion pale or slightly tinged with red, lips thin, eyes light and sparkling, pulse small, frequent, and easily excited by emotion, senses acute, thoughts and movements quick, imagination lively.

The *mixed* temperament is the most common in all races, though, generally speaking, some peculiarity of temperament predominates. These general descriptions may be adapted to the observation of disease amongst the natives of India, by close observation of the individual characteristics of the sick.

Different classes of diseases seem to attack persons with different temperaments. In those of sanguine temperaments, acute inflammations, and active hœmorrhages, are most common. In those of phlegmatic temperament, congestion, and sub-acute inflammations, glandular, and tubercular diseases, are seen. In the bilious, disorders of the digestive system, and depression of spirits. In the nervous, undue mental excitement, and diseases of the nervous system.

Dr. Wise, in his work on Hindu Medicine, points out, that the ancient Hindu physicians recognised seven different temperaments, and laid great stress on them. These temperaments were considered by them to be due to the excess of the different "humours;" first, excess of air (váyu); second, excess of bile, (pitta); third, to an excess of phlegm, (kofa); a fourth, fifth, and sixth to an excess of two of these humours, and a seventh temperament is produced by an excess of three humours, air, bile, and phlegm. The belief in the influence of these humours is of great interest to us in India, as it is so generally held by the natives of the country, and affects nearly all their views as to the causes of their indispositions.

Diathesis, has been defined by M. Littré, as a general tendency, in virtue of which an individual becomes the object of several local affections, similar in their nature. Thus we speak of the gouty, the rheumatic, the syphilitic, the purulent, the scrofulous, the calculus, the oxalic acid, diathesis. By *cachexia*, is meant, a depraved condition of the body, in which nutrition is everywhere defective (Power and Sedgwick), as the cachexia due to malaria, to syphilis, to scrofula.

Disease.—Russel Reynolds says, "Disease is defined to be the sum total of changes from a condition of health which may be recognised in either function, or structure, or both; and the names of diseases are merely held to be convenient expressions for their recognition." Dr. Williams says, "Disease of function, is known from its deviation from a standard furnished by physiology; and disease of structure, is recognised by a departure from a standard supplied by anatomy."

The Hindu Physicians, who founded their ideas of the pathology of disease on the derangements of the different "humours," left out of consideration altogether, the great influence of the solid tissues of the body; they had not the requisite chemical, histological, and microscopical, knowledge to understand, the great changes, which go on in the solid tissues, under what we recognize as normal nutrition, the conditions of which Paget, has defined, as, a *healthy state and composition of the blood, from which the materials for nutrition are derived; a regular, and not too far distant, supply of such blood; a certain influence of the nervous system;* and lastly, *a natural state of the part to be nourished.*

Ætiology, or the causation of disease.—The exciting causes of disease, are, chiefly mechanical, and chemical injuries, unwholesome food, undue exertion of mind or body, sudden and violent atmospheric changes, parasitic animals or plants, atmospheric poisons, poisons generated by the human body itself, and those of poisonous insects, reptiles and mammalians.

Diagnosis.—To make a satisfactory diagnosis is the aim and object of every medical man called in to treat a case. A satisfactory diagnosis is defined by Roberts, as implying a complete, exact, and comprehensive knowledge of the case under consideration, as regards the seat, extent, origin, and nature, of all existing morbid conditions; such a diagnosis cannot always be made, but, it should always be attempted, and the man who makes the fewest mistakes, will be the most successful in his diagnosis. The commonest error, is to rest content with merely ascertaining the chief symptoms present, perhaps giving a name to the group, such as dyspepsia; or to fix upon one permanent symptom, *e.g.*, ascites or jaundice, and call that *the disease*, while no attempt is made to interpret the meaning of the phenomena which are observed, or to find out the pathological conditions upon which they depend.

In attempting to form a diagnosis, a process of mental reasoning should be gone through, which needs to be more or less elaborate in different cases, according to their degree of difficulty, the facts elicited being passed in review, and certain conclusions founded upon them.

Methods of making a diagnosis,—A *direct* diagnosis may be made where there is some combination of clinical phenomena, or some *pathognomonic* symptom, clearly revealing the nature of the disease. A *differential* diagnosis is not so easy, diseases which resemble each other have to be called to mind, and discriminated from each other. A very careful consideration of all the elements which are available for assisting at forming a diagnosis is often required. These elements, when the patient is first seen are:—1. The *general history*, *family history*, and *previous health*. 2. The history of the *present illness*, as to its duration, probable cause, mode of invasion and progress. 3. The actual clinical phenomena observed, especially those of an *objective* character. Even after the fullest consideration of all these points, it is sometimes impossible to come to any, or to more than a doubtful conclusion. Under these circumstances it is extremely important not to form a hasty opinion, but to learn to wait, and see, what assistance the course of events may render. This rule is especially to be attended to, in cases of acute febrile disease, otherwise very serious mistakes are liable to be made. The further elements in the progress of a case which may aid diagnosis are —4. Its clinical course, duration, and termination. 5. The phenomena observed on repeated examination under various conditions 6. The results of treatment.

In some obscure cases, a diagnosis can only be made by the process of *exclusion,* i.e., by proving the absence of all diseases which might give rise to the symptoms observed, except one, the presence of which therefore is rather a matter of probability than actually indicated by any positive signs. Occasionally, it is quite impossible to come to any conclusion as to the nature of the malady from which a patient is suffering, and even, in the post-mortem room we are some times at fault.

Atkin, defines the art of diagnosis as the power of converting *symptoms* into *signs.*

Symptomology or Semiology.—All diseases of structure whether from external injury, or internal changes, cause some disorder of the functions of the body, and almost every disorder of due function, tends to derangement in those most closely connected with it. These disordered functions are called symptoms, for instance, redness, swelling, heat, and pain, are symptoms of inflammation.

The study of symptoms is called symptomology or semiology. The term symptom is variously used. 1st, objective symptoms are those ascertainable by the physician. 2nd, subjective are those expressed by feelings of the patients. 3rd, commemorative, include the previous history and condition of health. 4th, Diagnostic. 5th, Prognostic. 6th, Therapeutic, these terms describe themselves. 7th, Pathognomic, those peculiar to, or characteristic of, a disease. 8th, Indirect, those manifesting themselves through the medium of some other part, or of the system at large. 9th, Direct, or local, relating to the part affected.

Much confusion has arisen in the use of the word *sign.*

Frequently it is employed as synonymous with *symptom,* but, this is not correct, for a *sign,* really means a symptom which points to the nature of a disease; in short it is a *diagnostic* or *pathognomonic* symptom. Physical signs, strictly speaking include all *objective symptoms,* though, only such of these as are elicited by certain special methods of physical examination, are recognized by some as *physical signs.*

Prognosis.—To be able to foresee and predict what will take place in any individual case requires great experience and judgment. A correct prognosis implies a just diagnosis, an accurate knowledge of the natural course of the disease, an appreciation of all the peculiarities original and acquired which distinguish one man from another, and a large experience of the virtues and powers of remedies.

Never volunteer a prognosis to a patient or the friends; if asked, and your mind is clear, answer directly; if you are in doubt, be very cautious. Your statements if possible should be in a hopeful direction, as it will lead the patient and the friends to adhere to the treatment which you hope will be successful. In a clearly fatal illness when the patient or his friends asks you what is to be the result, you are bound to tell them.

CHAPTER III.

SCHEME FOR CASE TAKING AND DIRECTIONS REGARDING THE CLINICAL EXAMINATION OF PATIENTS.

This, and the two following Chapters, have been slightly altered from notes drawn up by the late Surgeon Major Chipperfield for the information of his class.

In order to form a correct diagnosis, it is important to carry in the mind a certain definite course of inquiry, according to which a faithful history of the case may be obtained.

The following plan of examination will be found useful.

Inquire into and record the age, occupation, race, caste, temperament, and habits of the patient.

Ascertain when the first departure from health occurred, how it was manifested, and in what order the morbid phenomena appeared.

The first deviation from health sometimes leads at once to the seat of disease.

The order of sequence of symptoms often helps us to trace the phenomena to their origin; but great caution is necessary here, as patients frequently mistake, and are unconcious of slowly advancing maladies.

The duration of the disease is important. *a.* It may at once lead to a knowledge of whether the disease is acute or chronic. *b.* It may tell of a previous condition of weakness or long ailment, which may not have been incompatible with the subsequent occurrence of acute disease, but which may materially guide in its treatment. *c.* By comparing the duration with the effect upon the patient, it may be known how far the suffering has been intense, for severe pain of long continuance must tell upon the general health.

It is better to make these inquiries at this stage of the examination. They need not now be recorded, but left until a subsequent stage when the *previous history* may be fully ascertained. Some physicians commence with the question "What is the matter with you?" Some with "Where have you pain?" The former question is objectionable as it often leads to one's obtaining merely extraordinary pathological opinions originating with the patient. I think it best to begin with the question "How long have you been ill," and gently and kindly stopping ramblings on the patient's part, to go on to :—

Ask the patient as to his feelings, and immediately proceed to examine the organ which his sensations indicate as principally affected.

Proceed to those organs which are most intimately connected, anatomically and physiologically, with that or those principally affected.

Make a general interrogation of the functions and physical condition of the different systems of the body.

Record these particulars as the *present history* or *state* of the patient.

If not previously recorded, now, note down the *past history* or *commemorative symptoms* of the case, and inquire into and record the general antecedents of the patient as to hereditary disposition; place of residence; previous diseases; whether exposed to infection, fatigue, heat, cold, or moisture. If a *female,* whether single or married, childless or how many children, age of the last, number of miscarriages if any, and at what period, general condition of the menstrual functions, &c.

It is of no importance in what order the different systems of the body are interrogated, but whilst examining the patient note :—

His *general appearance :—a.* Size, including emaciation or increase of bulk, whether general or local, *b.* Aspect of face and expression.

His *position* or *posture*:—*a.* In bed; the manner of lying—on the back, on either side, quiet, restless, &c. *b.* Out of bed; posture, gait, stiffness or loss of power of limbs.

Integumentary system. Colour, rough or smooth, dry or moist, temperature, perspiration, marks or cicatrices, eruptions, anasarca, œdema, emphysema, other swellings.

Circulatory system. Arterial pulse—number of beats per minute, strong or feeble, full or small, hard or soft, equal or unequal, regular or irregular, dicrotous, intermittent, imperceptible, regurgitant, &c. *Venous pulse*—if perceptible, observe position, force, &c. *Heart*—uneasiness or pain, extent of dullness, impulse; apex beat, action and rhythm, sounds, their character, and the position and direction in which heard loudest.

Respiratory system. Nares—sneezing, discharges. *Larynx and trachea*—voice, natural or altered, hoarseness, aphonia, difficulty of articulation. *Pharynx*—examine epiglottis, tonsils, &c. *Thorax*—external form of chest, round or flattened, symmetrical or not. Movements—regular, equal, amount, &c. Cough—rare or frequent, short or long, moist or dry, painful or not. Expectoration—trifling or profuse, easy or difficult. Sputa—thin or inspissated, globular or nummular, frothy, mucous, muco-purulent, rusty, bloody. *Lungs*—state of respiration, easy or difficult, quick or slow, labored, painful; amount and character of dyspnœa; odour of breath. Resonance of thorax as determined by percussion. Breathing sounds by auscultation, situation and character of abnormal murmurs.

Digestive system. Mouth—lips, teeth and gums, their state. *Tongue*—abnormal taste, mode of protrusion, colour, furred, coated, fissured, moist or dry. *Fauces, pharynx,* and *œsophagus*—deglutition, regurgitation, physical condition of throat. *Stomach*—appetite, thirst, nausea, vomiting, character of vomit, uneasiness or pain, swelling, tumour, flatulence, eructations. *Abdomen*—palpation, pain, distension or retraction, tumours, constipation, diarrhœa, character of stools, hæmorrhoids. *Liver*—size, percussion and palpation, pain, uneasiness, jaundice. *Spleen*—size by percussion and palpation.

Nervous system. Brain—cephalalgia, perverted or diminished intelligence, hallucinations, idiocy, monomania, delirium, stupor, sleep, dreams, vertigo, &c. *Spinal cord* *and nerves*—pain in back, general sensibility, increased, diminished, or absent. Special senses—sight, hearing, smell, taste, touch, anything abnormal. Spinal tenderness—motion natural or altered, fatigue, pain on movement, trembling, convulsions, contractions, rigidity, paralysis.

Genito-Urinary system. *Kidney*—lumbar pain, mode of micturition; quantity and quality of urine, reaction, specific, gravity, colour, precipitates (*vide* scheme for the examination of the urine.) Discharges from urethra, spermatorrhœa. *Uterus*—condition of menstrual discharge, leucorrhœa, &c.; pain in back, uterine or ovarian tumours. Mammary glands, function of how performed.

Such is called a *general examination* of the patient. It is not necessary to record negative results, but everything actually abnormal or unusual should be noted. The absence of a symptom which usually is present in the disease under which a patient is suffering should always be recorded; as the absence of expectoration when all the other signs of pneumonia are present.

CHAPTER IV.

SPECIAL MODES OF INVESTIGATION.

Inspection, Palpation, Percussion, Auscultation, Measuration.

Inspection.—A careful inspection of the organ affected and of its neighbourhood should be made. This supposes that the student is well acquainted with relative and regional anatomy. The following should invariably be recorded:—

Inspection of the *general appearance* and *posture*, of the *countenance*, and of the *neck* and *thorax*.

Observe the condition of the cervical glands and any peculiarities about the chest.

Inspection of the *abdomen*, except in females, when there are no prominent symptoms pointing to this region.

Palpation.—Performed either with the tips of the fingers, with the whole hand, or with both hands.

This mode of investigation is necessary to afford information: —

(*a*) As to increased or diminished sensibility; (*b*) as to altered size, form, density and elasticity of various parts; (*e*) as to the movements to which parts are liable; (*d*) as to the presence or absence of fluid.

Thus by palpation we learn the existence of hyperæsthesia or anæsthesia; various conditions of the abdominal organs; palpitation and impulse of the heart; amount of vocal fremitus; of œdema, emphysema, fluctuation, &c.

Percussion.—May be *mediate* or *immediate*. The former is preferred, a finger of the left hand being placed upon the part and steadily struck with the tips of the first three fingers of right hand; or the pleximeter and hammer may be used. The student should familiarise himself with the natural percussion sounds of healthy organs before attempting any investigation of those diseased.

Percussion elicits certain *sounds*, their tone depending upon the condition of the organ, the force used, and the part percussed:—

(*a*) The *tympanitic sound*, the organ containing air. *Example.* The empty stomach, or a distended colon. (*b*) *The resonant sound*, the organ consisting of spongy parenchyma and air. *Example.* The healthy lung. (*c*) *The humoral sound*, the organ containing fluid. *Example.* A distended bladder, ascites. (*d*) *The parenchymatous sound*, the organ formed of a dense parenchymatous tissue throughout. *Example.* The liver, the heart, an ovarian tumour.

Percussion elicits a peculiar sensation on striking hard, soft, or elastic bodies. This is called the sense of *Resistance.*

Auscultation.—Ascertains and appreciates the nature of the various sounds which occur in the interior of the body. It is most useful as regards the respiratory and circulatory organs; but is sometimes practised on the abdomen, especially to detect pregnancy.

Auscultation is either *immediate*, the ear applied directly to the part; or *mediate*, through the intervention of the stethoscope. The latter is generally used. It is absolutely necessary that the student should familiarise himself, by practice, with the use of this instrument, and the natural sounds of healthy organs.

It must be borne in mind that auscultation is but an auxiliary means of diagnosis, and conclusions as to the nature of the disease must never be formed from it alone; *all* the circumstances of the case must be duly considered.

For the purpose of conveniently indicating the exact seat (*a*) *Pulmonary murmurs*, heard in the lungs, called by Bennett and others *vesicular respiratory murmurs.*

These are very fine, soft sounds; the *inspiratory* is gentle, neither liquid nor dry, soft, of a certain duration and intensity, gradually developed and continuous. The *expiratory* is slightly harsher than the inspiratory, and of lower pitch, it is the weaker and is slightly the longer of the two; it is directly continuous with the former. In some persons it is so weak as to be actually inaudible.

(*b.*) *Bronchial murmurs,* heard a little to the right and left of the manubrium of the sternum, and in the interscapular space. Both murmurs want the softness and gentleness of the pulmonary species. They are slightly harsher, and of higher pitch, and the expiratory is less accurately continuous with the inspiratory, than is the case with the pulmonary murmurs.

(*c.*) *Laryngeal and tracheal murmurs.* The sounds are more intense, less soft, drier, hollow, of higher pitch, and of greater duration than those of the other species. An interval of some duration separates the expiratory from the inspiratory murmur, and the duration of the former equals or exceeds the latter.

(*d.*) All of these sounds are intensified or exaggerated in *forced respiration.*

(*e.*) There are varieties also, compatible with health, with reference to age and sex. The murmurs are louder in infancy than in adult age, and generally speaking in men than in women, especially when of active habits: in weakly individuals they are frequently inaudible except on forced respiration.

The Resonance of the voice. Over the larynx and trachea the voice is transmitted, imperfectly articulated, with a certain degree of force and loudness,—*Natural laryngophony and tracheophony.* Over the bronchi, the intensity is much reduced, and more diffused,—*Natural bronchophony.* Over the rest of the thorax it is scarcely audible or is an obscure buzzing.

Under diseased states of the respiratory organs, it will be observed that there are: 1, alterations of these natural sounds; 2, superadded, or new, or abnormal sounds, never heard in health.

Alterations of the Natural Sounds.

In respect of *Intensity* :—*a.* The murmurs may be louder in one part than in another, in one lung than in the other, —*Puerile respiration* ; this indicates increased action in one part compensatory to diminished action in some other part. *b.* The murmurs may be feeble or diminished in intensity in old age,—*Senile respiration* ; (the inspiratory murmur generally lessened in duration whilst the expiratory is increased). *c.* The sounds may be feeble or diminished without any alteration of rhythm,—*Weak respiration.* This occurs in feeble people, in pleurisy, in infarction of the air cells and smaller tubes, as in pneumonia and phthisis. *d.* The murmurs may be absent in extensive pleuritic effusion.

In respect of *Character* ;—*a.* The pulmonary respiratory murmurs may be *rude* or *harsh,* indicating altered texture, as in phthisis. *b.* The bronchial murmurs may also be *harsh,* as in pneumonia. *c.* The murmurs may be hoarse or blowing, *cavernous,* when a cavity has formed. *d.* They may be *amphoric,* when pneumo-thorax is combined with a pulmonary fistula.

In respect of *Position* ;—Sounds natural to certain parts may in disease be heard at places where in health they are never detected. *a.* In pneumonia, *bronchial* or *tubular* breathing may be heard where only *pulmonary* murmurs should exist. *b.* In condensation or ulceration of the lungs, *bronchophony* or *pectoriloquy* may be detected where ordinarily there is no resonance of the voice.

In respect of *Rhythm* :—

In health, the duration of the pulmonary inspiratory murmur, is to the expiratory, as ten is to twelve (Foster). In disease, this may be altered or even inverted. The expiratory murmur is often unnaturally prolonged in incipient phthisis. It is three or four times longer than the inspiratory murmur in emphysema, and chronic bronchitis.

SUPERADDED, NEW, OR ABNORMAL SOUNDS.

Friction or Rubbing Sounds. Caused by some morbid change in the pleuræ. *a.* Soft or fine friction sound. The pleura covered with a thin soft exudation. *b.* Rough friction sound. The exudation tough and thick. *c.* Creaking, grating, rasping friction sound. The exudation hard, dense and rough.

Moist Râles or Rattles. Rhonchus. Produced by bubbles of air traversing or breaking in a somewhat viscid fluid. May be heard in the bronchi, or in cavities of various sizes.

Present in pneumonia, bronchitis, pulmonary apoplexy, phthisis, &c. Various names have been applied to râles according as they are fine or coarse. Fine râles are mucous, sub-mucous, crepitating, sub-crepitating. Coarse râles are called cavernous, cavernulous, gurgling. It is only important to recognize that the sounds are *moist*, that they are fine, or coarse, in proportion to the size of the tubes, or cavities, in which they are produced, and the amount of fluid present.

Dry Vibrating Murmurs. Arise when air tubes are obstructed, constricted, or loose their elasticity and become enlarged. They may be fine or coarse. If of a fine, whistling character they are called sibilant, clicking, hissing, whistling. If hoarse and snoring, sonorous, croaking, rubbing, cooing. These *dry* murmurs are usually heard in acute bronchitis, emphysema, and when cavities are empty.

The Vocal Resonance may give rise to abnormal sounds. A soft trembling, like the bleating of a goat is called *ægophony*. It is probably produced by vibrations in a thin layer of serous fluid between the pleuræ. *Metallic tinkling*, a sound like dropping a shot into a large metal basin, is sometimes heard after a cough in chronic phthisis. The cause is not ascertained.

THE CIRCULATORY SYSTEM.

(*a.*) PERCUSSION. The precise limits of the heart are to be marked out by percussion. The student's anatomical knowledge must be brought to bear here, for it is to be presumed that he knows the position and size of the organ. The normal size of the heart differs in different individuals. Limit the superior margin of the organ first, then the lateral margins; if the transverse diameter of the dulness be more than three inches, the heart is in most cases abnormally enlarged. Very many conditions may cause an increase of the space of cardiac dulness; some of these are referable to the heart itself, hypertrophy with dilatation, hydropericardium, pericarditis, &c., whilst some are connected with neighbouring organs, increased size of the left lobe of the liver, aneurisms, consolidation of the lungs, &c.

(*b.*) By PALPATION the seat of apex beat and impulse of the heart are to be ascertained.

AUSCULTATION.

(*a.*) By means of the stethoscope we ascertain:—1, the character and rhythm of the sounds of the heart; 2, the place where each sound is most plainly heard; and 3, the direction in which the sounds are propagated.

(*b*). It is to be presumed that the student is well acquainted with these matters in health. (Vide the rhythm of the heart.) The alterations which take place in disease are:—*a*, modifications of the healthy sounds; *b*, superadded, new or abnormal sounds.

MODIFICATIONS OF THE HEALTHY SOUNDS.

These refer to the seat, intensity and extent, character, and rhythm of the sounds.

(*a*.) In respect of *Seat*. The sounds may be heard at a *higher* point than natural, owing to any kind of abdominal swelling pushing up the diaphragm. *Lower* than natural, from tumours at the base depressing the heart, enlargement of the auricles, hypertrophy with dilatation of the left ventricle. More on *one side*, from air or fluid in the pleural cavity pushing the heart laterally. Deformity of the thoracic bones, aneurisms of the large vessels, tumours in the mediastina, &c., may modify the natural position of the sounds.

(*b*.) In respect of *Intensity* and *Extent*. *Diminished*, when the heart is atrophied or softened, when there is pericardial effusion, concentric hypertrophy of left ventricle, or emphysema of the anterior border of left lung. *Increased*, in nervous palpitations, hypertrophy with dilatation, consolidation of neighbouring portion of lungs.

(*c*.) In respect of *Character*. *Clearer* if the walls of the heart are thinned; *duller*, if they are thickened; *muffled*, in cases of hypertrophy or softening of the muscular tissue. Sometimes *roughened*, in various morbid states.

(*d*.) In respect of *Rhythm or Time*. Either the first or second sound may be *prolonged* so as to mask the other. The action may be *irregular* or *intermittent*. Sometimes so increased as to be called *tumultuous*. These alterations of rhythm attend various cardiac affections; but the action of the heart and the pulse may be irregular or intermittent in numerous affections altogether independent of any special disease in the heart.

The Rhythm of the Heart (Michael Foster).—The sounds have been compared to the words lŭbb-dŭp followed by a pause.

The following are the phenomena which occur during the pause, the first, and the second sounds:

PAUSE.—1*st Part*—Completed distension of the auricles, and in the

2nd Part—Their contraction and the distension of the ventricles.

It occupies about a half of the whole period.

FIRST SOUND.

1. The contraction of the ventricles.
2. The first part of the dilatation of the auricles.
3. The closure of the auriculo-ventricular valves.
4. The opening of the semilunar valves.
5. The propulsion of blood into the arteries.
6. Impact of the apex against the thoracic wall.

It occupies about forty-five per cent. of the time.

SECOND SOUND.

1. The closure of the semilunar valves.
2. The continued dilatation of the auricles.
3. The opening of the auriculo-ventricular valves.
4. Flowing of the blood through the auriculo-ventricular openings.
5. Commencing dilitation of the ventricles.

It occupies about five per cent. of the time.

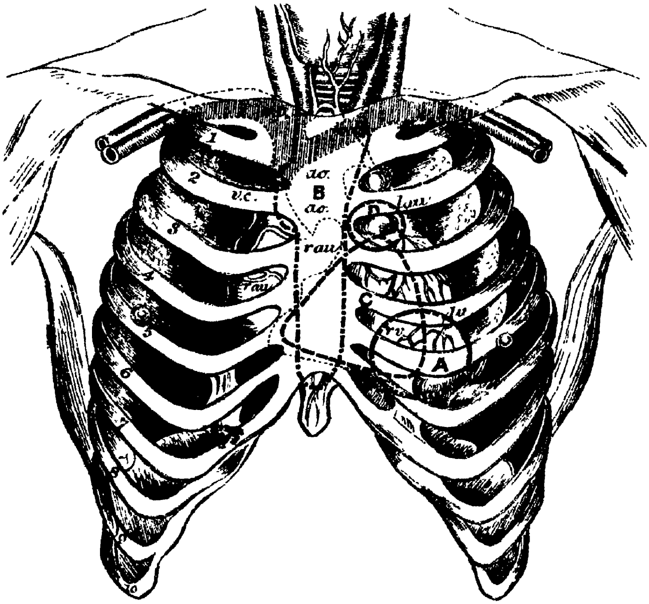
SUPERADDED, NEW, OR ABNORMAL SOUNDS.

These are of two kinds :—

(*a.*) *Pericardial, Exocardial, or Friction sounds.*—These are very similar to the friction sounds met with in the pulmonary organs. They are sometimes so *soft* as to resemble the *blowing* murmurs to be presently noticed, but superficial in character and limited in extent. More often they are *louder* and *rougher*.

(*b.*) *Valvular, Endocardial, or Vibrating sounds.*—These are all occasioned by diseases interfering with the functions of the valves. Some are so *soft* as to resemble the passage of the gentlest wind ; others are somewhat *rougher,* like the puff from the nozzle of a bellows, *bellows murmur ;* others are still *harsher,* and are termed *sawing, grating, filing, rasping.* They may be single, either *systolic* or *diastolic ;* or double, having their origin both in the auriculo-ventricular and arterial valves. Occasionally these sounds resemble *musical notes,* the *cooing* of doves, *twittering* of birds, *whistling* or *tinkling.* Such sounds may depend upon various causes, as great narrowing of the orifices, perforations in the valves, irregularity of their margins, bead-like exudations upon their surface,—any causes which induce vibrations of solids in the blood.

FIG. 3.



[illegible] howing the areas over which the murmurs produced in the different valves of the heart are chiefly audible. A. The seat of the mitral murmur. C. The seat of the tricuspid. B. Seat of the aortic. D. Seat of pulmonary murmur, *r. v.* Right ventricle *l. v.* Left ventricle. *l. au.* Left auricle. *r. au.* Right auricle, *ao.* Aorta, *v. c.* Vena cava. presystolic murmurs are heard to the inner side of the apex just below and to the left of A and up towards the left axilla. [Gairdner].

(c.) *Physical signs of Valvular Diseases of the Heart* (Tanner).—Either, or both sounds of the heart are accompanied or supplanted by a bellows-murmur (*bruit de soufflet*). A murmur may be harsh, or rough, or cooing, or whistling, or musical, modifications of but slight importance. Of whatever character, a murmur is caused either by alterations of the valves or orifices, or great vessels, these are called *organic murmurs ;* or, by an altered state of blood, giving rise to what is called an *inorganic,* or *functional,* or *hæmic murmur.* The lining membranes, valves, and orifices of the left side of the heart are much more frequently diseased than those of the right.

Signs of the diseases of the aortic and mitral valves may be thus briefly given:—

Aortic Obstruction.—Systolic murmur, often rough, at right second intercostal space and along great arteries. Pulse regular, small and long.

Aortic Regurgitation.—Diastolic murmur, usually smooth, at right second space, and downwards along sternum or towards apex. Pulse regular, jerking and collapsing. Most commonly there is also obstruction and the murmur is double.

In aortic disease the left ventricle becomes hypertrophied, and the apex beat is displaced downwards.

Mitral Regurgitation.—(the most common form of valvular disease).—Systolic murmur at, and to the left of the apex beat. Pulse irregular in force and frequency, soft and weak.

Mitral Obstruction.—Presystolic murmur (often absent) at inner side of apex, frequently accompanied by thrill. First sound sharp. Pulse usually regular, but soft and weak.

In mitral disease the right ventricle becomes hypertrophied in consequence of obstruction to the passage of blood through the lungs, and the apex beat is displaced to the left of its normal position.

Tricuspid Regurgitation (usually secondary to mitral obstruction or regurgitation).—Systolic murmur near ensiform cartilage. Pulsation in jugular vein.

The semilunar valves of the pulmonary artery may be supposed to be diseased when the bellows-murmur can be traced from the middle of the left edge of the sternum up towards the left clavicle; and when this murmur cannot be heard in the subclavian or carotid arteries.

To determine the systolic or diastolic character of a murmur, the apex beat, or the pulse in the carotid, should be carefully noted during auscultation: if systolic, the bruit must be synchronous with the carotid pulse; if diastolic, after it; if presystolic, just before it, and running up to the apex beat.

AUSCULTATION OF THE LARGE VESSELS.

(*a*) In the large vessels, near the heart, the two natural sounds may be heard; a little more remotely the two sounds become indistinct; still more remotely only one sound is heard, dull, but in health, soft; under disease, these sounds may be modified in various ways. There may be a single, or double *bellows murmur*, or it may be *harsh*, *grating*, *&c.* First ascertain whether such sounds originate in the heart by auscultating that organ. If the sound originate in the vessel it may proceed from stricture of the vessel, from pressure upon it, from its dilatation, or from roughness of its walls.

(*b*) Sometimes a soft *systolic* blowing is heard at the base of the heart, or over the carotid arteries, or internal jugular vein. The sound may also be continuous, when it is called the *bruit de diable*. These sounds are hæmic, and are distinguished from valvular murmurs:—1, by being systolic at the base of the heart; 2, by their softness; 3, by not being permanent; 4, by occurring in debilitated people and especially in spanæmic and chlorotic girls.

CHAPTER VI.

EXAMINATION OF THE ABDOMINAL ORGANS.

The following notes have been principally compiled from Guttmann's valuable Hand-book of Physical Diagnosis.

Regions. For purposes of description the abdomen has been divided into different regions, *vide* Figs. 1 and 2, page 70.

Inspection.—This is not as a rule much assistance, it must be checked by palpation; enlargement may be *partial* or *general*; partial enlargement is most commonly due to increase in the size of certain of the subjacent organs,—the liver, spleen, uterus, ovaries. Dilatation of the stomach gives rise to a uniform, somewhat oval-shaped swelling in the epigastric region. Cancer of the stomach only manifests itself when the tumour is large. Large fæcal accumulation in the colon forms often an elongated and often movable tumour in the right or left side. Peristaltic movements in the bowels are seen inthe portion of the bowel above the seat of a stricture, tumours of the omentum (carcinomatous, hydatid) sometimes attain a large size. Tumours of the uterus; physiological (pregnancy) and pathological (fibromas, &c.), so long as they are not of unusual size, keep generally to the middle line of the abdomen. Tumours of the ovaries first make their appearance low down in the abdomen, in the region corresponding to the anatomical site of the organs, to one or other side of the median line. Often when large it is impossible to say at which side they commenced to form. As a rule they are movable; when the patient turns on one side, the tumour seeks the more dependent parts of the abdominal cavity and there renders the integment more tense.

Diseases of the *kidneys* which may be recognized on inspection are *cancers* and *hydronephorosis* when large. A *dislocated* or movable kidney occasionally. The bladder when distended with urine projects in the median line.

Uniform general intumesence of the abdomen is produced most commonly by the presence of some abnormal material in the peritoneal *sac* (usually fluid, more seldom gas), or by distension of the intestines by gas.

Distension of the epigastric and mammary veins is always a sign of engorgment of the portal vein and of the whole portal system. It is common in cirrhosis of the liver. If the lower extremities are œdematous as well, and their veins enlarged the obstruction is in the inferior vena cava.

Diminution in volume (*depression*) is usually accompanied with signs of general emaciation. The boat-shaped depression of the surface of the abdomen noted by Trousseau in the basilar meningitis of children, is caused by the contraction of the muscular coat of the intestines, from irritation of the nervous centres which govern the movements of the bowel.

Palpation.—This is a method of the first importance in the investigation of abdominal diseases. It enables us to determine the size, form, consistence, and situation of the various organs, and discloses the existence of tenderness to superficial or deep pressure, the presence of any abnormal substance, or body in the abdominal cavity, &c. But it reveals simply the *physical condition* of the parts and not the exact nature of the diseases by which they may be affected. It is most conveniently practised when the patient is laid on his back, or occasionally, on one or other side, sometimes with the thighs flexed. If the abdominal organs are in their normal condition the hand meets with no unusual resistance when applied to the surface.

Palpation of the Liver.—In the normal condition it can only be felt as a sense of resistance below the arch of the ribs, There may be enlargement without pain, or enlargement with pain; there may be tenderness and œdema of the superficial structures. Note the character of the surface whether smooth or rough, its consistence, any change of form, the presence of fluctuation, "or of the hepatic fremitus" of Briançan which is characteristic of echinococci in the liver. A distended gall bladder is sometimes seen.

Palpation of the Spleen.—As long as it retains its normal dimensions it cannot be touched with the palpating finger. On palpating during deep inspiration while the patient is lying on his right side, a slight degree of enlargement may be felt deep in the left hypocondrium. When enlarged it generally retains its original form, the enlargement being nearly equal in all its diameters, note its consistence, the state of its surface, if it is *dislocated, moveable,* or *wandering.*

Palpation of the Stomach and Intestinal Canal.—Note if there is any pain, tenderness, new formations, or fæcal accumulations (irregular moveable masses changing in shape from day to day); peristaltic action in cases of stricture, obstruction, or intussusception of the intestine, is sometimes seen; ileo-cœcal pain is found in inflammation of the cæcum, enteric fever, and perforation of the vermiform appendix. Tumours of the omentum, of the pancreas, and of the retro-peritoneal glands can sometimes be defined. In diseases of the peritoneum when there is accumulation of fluid in the peritoneal sac fluctuation is felt; there is pain in peritonitis; irregular nodules may be felt in cancerous growths; there is movement of the fluid on change of position when it is not circumscribed; frémissement is occasionally felt.

Palpation of the Uro-genital Apparatus.—The kidneys are sometimes *movable* or *wandering,* in hydronepherosis. The kidneys in their normal position can only be felt in thin persons. Œdema may be found in the lumbar region in cases of chronic albuminuria. A distended bladder is felt as a firm, elastic, oval-shaped tumour, in the pubic and umbilical regions. Hypertrophy of the prostrate can be felt through the rectum. Tumours of the ovaries and uterus are usually made out with ease by palpation, and examination per vaginam, *vide* chapter on vaginal examination.

Percussion, should be practised when the patient is made to lie on his back. It is directed to the delimitation of certain organs,—the liver, spleen, and gastro-intestinal canal, very rarely the kidneys. The pancreas, ovaries, and uterus, when of their normal size, are not definable by percussion.

Its diagnostic importance is merely secondary, the information gained by palpation is much more reliable.

Percussion of the liver.—The normal area of *absolute hepatic dulness,* extends on the front of the chest from the sixth rib superiorly to the margin of the arch of the ribs inferiorly, and reaches in the median line to midway between the base of the xiphoid cartilage, and the umbilicus: over this there should be always a dull sound on percussion. The area of *relative dulness,* which is caused by the presence of a portion of the lung in front of the convex surface of the liver, extends as high as the fifth intercostal space, it can rarely be defined exactly.

It should be percussed during the respiratory pause, and generally along four lines—the *axillary, mammillary, parasternal* and *median.*

The *upper boundary* of the normal hepatic dulness is found at the eighth rib in the *axillary line,* at the upper (sometimes at the lower) border of the sixth rib in the *mammillary line,* at the upper border of the fifth rib (sometimes in the fifth intercostal space) in the *parasternal line,* and at the base of the xiphoid process in the *median* line. Posteriorly the liver rises as high as the level of the tenth rib.

The *lower limit* of the hepatic dulness is situated between the tenth and eleventh ribs in the *axillary line,* in the *mammillary* and *parasternal* lines it comes close to the edge of the arch of the ribs. In women it is sometimes lower owing to tight lacing. In the *median* line the hepatic dulness reaches downwards to nearly midway between the base of the xiphoid cartilage and the umbilicus; from the *median* line it extends about ten lines, at most an inch to the left, where its lower edge turning upwards, passes into the lower margin of the cardiac dulness and there ends in the upper border of the hepatic dulness.

Posteriorly the lower boundary of the liver-dulness is no longer demonstrable beyond the scapular line, in which it is situated at the level of the eleventh rib; the dulness is here undefinable, being lost in that arising from the thick mass of the dorsal muscles. The percussion sound is not equally dull at all parts of the hepatic area as it is modified by the proximity of the stomach and bowels.

There may be enlargement, contraction, displacement or dislocation of the liver.

Percussion of the spleen is carried on equally well while the patient is in the sitting, standing, or in the recumbent posture. When enlarged it should be tested in the two latter. If the patient is lying on the right side, the area of dulness shifts. The percussion note is less dull, and less certain, than that of the liver on account of its surroundings. It should be percussed during the respiratory pause. The long diameter of the spleen is directed obliquely from above and behind, downwards and forwards. Its upper or posterior end is situated close to the body of the tenth dorsal vertebra, in the concavity of the diaphragm, and under the edge of the left lung, while its lower and anterior end is found behind the eleventh rib near its free termination, that is, somewhat posterior to the middle axillary line. The *anterior* border of the spleen runs parallel with the ninth rib, the posterior parallel with the eleventh. The organ is more or less rounded at its upper and lower ends.

Percussion of the Stomach.—It is impossible to limit this organ on account of its surroundings. The *pitch* of the note depends on the contents of the organ.

Percussion of the Intestines.—In health the percussion sound over both large and small is always tympanitic, the sound varying according to the contents.

Percussion of the kidneys is not of much use; percussion of the bladder or uterus is only of use when they are enlarged.

Auscultation is not of much use as the sounds are as a rule merely accidental and irregular in occurrence (except the placental murmur and the fœtal heart). Auscultation of the œsophagus is sometimes of use in case of stricture, auscultation of the stomach and intestines gives gurgling and rumbling sounds (borborygmi). Occasionally friction murmurs may be heard where there is some roughness of the peritoneal coat; clicking of gall stones in the gall bladder has been heard.

Examination of Vomited Matters.—Note the reaction, whether there is hæmatemesis from its coffee-ground appearance, examine microscopically for sarcinæ. See the chapter on the use of the microscope.

Examination of the Intestinal Discharges.—Worms are sometimes vomited; note the smell; and whether the vomited matter is stercoraceous or not. Note the number, shape, and character of the motions, note when there is constipation alternating with diarrhœa. The consistence of the motions depends on the time taken by the intestinal contents in travelling through the bowels. An absence of bile is due to closure of the bile ducts, or its non-secretion. The colour of the motions is modified by different medicines as calomel, iron, logwood, &c. Note the presence of abnormal substances in the intestinal discharges, as blood mingled with the fæces or disposed in streaks on their surface, coagula, tarry appearance, pus, mucous secretions, tissue elements, undigested portions of food, fungi, worms, calculous formations as gall-stones and intestinal calculi. Gall-stones, are composed chiefly of cholesterine soluble in alcohol and ether. Intestinal calculi are formed of certain salts around some foreign body as a fruit-stone, blood-clot, or undigested fragments of food, &c. For further information on this subject, look to the chapters on the examination of the excreta, and the chapter on the use of the microscope.

CHAPTER VII.

OBSERVATIONS ON THE TEMPERATURE OF THE HUMAN BODY.

The clinical thermométer was first used by De Haen, A.D. 1754, in Vienna; it is our instrument for accurately measuring the degree of heat of the human body. The notes of any case in which there has been even a slight pyrexia are incomplete without a record of the temperature, taken at least twice a day between 7 to 9 A.M. and 5 to 7 P.M., see Chart, page 89. In severe cases it should be taken once every three or four hours; and in intermittent fevers at the commencement, height *(acme)*, and end of the paroxysm.

The use of the thermometer can never do away with the absolute necessity of a student learning to guage the temperature of the skin by his own hand.

The best place in which to "take" the temperature is the closed axilla. In the mouth it is about ·3° F. and in the rectum about ·6° F. higher than in the axilla. The instrument should be self-registering, it should be slightly warmed by the hand till it rises to say 94° F. or so, and then placed in the closed axilla which should be dried before hand, and kept applied there for at least five minutes, (15 to 20 Guttmann). In the cases of children, or weakly persons, the observer must watch the arm or the thermometer will easily be broken. The record should be entered on a "temperature chart" which is always remarkably useful in recalling the progress of a case. It is well not to allow the patient to know what the record is, as it often leads to unnecessary anxiety on his part.

Temperature of healthy persons.—The normal temperature is subject to a daily fluctuation entirely independent of external circumstances, rising continually from *morning till evening and sinking again from evening till morning.* It is at its lowest 97·5° to 98° F. at two hours after midnight, remaining about the same point till early morning; it then rises slowly and constantly till 4 or 6 in the afternoon when it is at its highest 99° F. to 99·3° F. (99·9° F. Crombie), this temperature is maintained for a short time when it again sinks, at first, slowly, afterwards, more quickly to the morning minimum.

The difference between the morning minimum and the evening maximum is about 1·3° F.

Surgeon Crombie's observations lead him to believe that the mean temperature of Europeans in lower Bengal is ·5° F. higher than in England. He also says that the temperature of natives of India including East Indians, is higher than that of Europeans resident in India by about half a degree of Fahrenheit.*

Dr. Ringer states that in persons under 25, the average maximum temperature is 99·1 °F, in those over 40, 98·8° F. The normal temperature is *raised* by active exercise, and temporarily by taking food. It is *diminished* by exposure to cold without active exercise, by severe mental exertion, and by cold bathing.

The guide for the clinical observer to follow is thus stated by Aitkin. *A rise above 99·5° F., or a depression below 97·3° F, is a sure sign of some kind of disease, if the change is persistent.*

In the diseases attended by pyrexia of 100° or 101° F. only, signifies a mild attack, (*slight fever*); a constant temperature of 105° F. implies severity of disease (*severe fever*); a rise to 106° or 107° F. (*high fever*) denotes danger; a fatal termination may be expected if the thermometer shows a rise to 109° or 110° F. A regular fall of temperature towards evening in continued fevers denotes commencing convalescence, a gradual rise from morning to evening is bad, the reverse is favourable. A high evening temperature means an incomplete recovery, or the probable occurrence of some complication—such as suppuration, &c. When the inflammatory changes cease in a tissue, the temperature falls.

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* Indian Annals of Medical Science, January, 1874.

A favourable fall in temperature, if not accompanied by a proportionate fall in the rate of the pulse and respirations should not be depended upon, and may be an unfavourable sign. In convalescence a sudden rise in temperature indicates a probable relapse, and hence the importance of watching the temperature of those convalescent from severe febrile diseases who are not clearly making satisfactory progress. A subnormal temperature is nearly always an unfavourable symptom.

If you wish to test the accuracy of a thermometer where there is no standard one available to check it by, take the temperature of your own body, daily, at the same hour while in good health, and under the same conditions, with the instrument you wish to test, if it registers the normal temperature daily it is accurate enough for clinical purposes.

Relation of pulse and temperature.—Aitkin lays it down as a rule that an increase of temperature of 1° F. above 98° F. corresponds with an increase of 10 beats of the pulse per minute. A temperature of 98° F. corresponding with 60 beats of the pulse per minute. The rate of the respiration multiplied by four ought to correspond closely with the rate of the pulse.

The *March of the temperature* of the body in acute diseases attended by pyrexia presents *three* distinct types according to Guttmann, viz., *continued, remittent, intermittent,* and *relapsing.*

Continued fever.—Simultaneously with the commencement of the disease which is usually announced by a rigor, the temperature begins to rise rapidly and continuously to a certain height 103° to 106° F. at this point it remains several days, showing only the ordinary daily fluctuations ·9 to 1·3° F. under favourable circumstances, the temperature then falls almost as speedily and continuously as it rose, usually within twelve, twenty-four, or at most thirty-six hours, to the normal point, or even slightly lower, in the latter case, to return again to the temperature of health when convalescence is established. The best example of this type of fever is seen in fibrinous pneumonia in the adult, in which defervescence begins about the seventh day, seldom earlier. Such a febrile condition, in which the temperature during the *acme* shows little or no variation for several days, have received the name of *continued fever.*

Remittent fever.—In many other acute diseases the temperature rises more slowly, so that several days elapse before it attains its maximum, this rise may be continuous, the normal daily fluctuation being still traceable, or it may be interrupted. The *acme* may last days, or weeks, and be characterized by much greater daily variations than are found in health. These *exacerbations* or *remissions* resemble those of the normal range, inasmuch as they occur at the same times—morning and evening ; the exacerbation is usually at its height in the afternoon, or evening, the remission at its lowest point in the early morning. The daily difference amounts to 1·5° or 2·5° F. When the disease has a favourable issue, the return to the normal temperature is *gradual,* and takes place in either a continuous descending line, (that is, without the evening exacerbation), or, in such a way that both the morning and evening temperatures are each day lower, or, the morning remission may be well marked, while the evening exacerbation remains, but, becomes smaller on each day, and thus slowly approaches the morning temperature. This gradual re-establishment of the normal temperature, which is accomplished in from three to seven days is designated *Lysis,* as distinguished from rapid defervescence or *Crisis ;* and the febrile condition marked by the above mentioned oscillations is named *remittent fever.*

Intermittent fever.—The third typical course which may be taken by the temperature is found in *intermittent fever.* The paroxysm begins suddenly, usually with a shivering, and the temperature speedily rises to a height otherwise reached only in the most severe acute diseases 105·5 to 106° F. or even higher, in a few hours it sinks again as quickly, and continuously to the normal point. On the third day (tertian type), on the second day (quotidian type), that is after forty-eight or twenty-four hours, the same phenomena are repeated at the same time; when the febrile paroxsym is later by a few hours (*postponing type*), the quotidian becomes tertian, and similarly, when it is earlier by a few hours (*anticipating type*), the tertian becomes quotidian. In the *quartan* type, the fever returns at the end of seventy hours. In the intervals of exemption from fever (*apyrexial stage*), the temperature, and general condition of the patient may be perfectly normal.

Relapsing fever.—In other cases, of which the type is *relapsing fever,* the febrile attack lasts longer, the temperature mounts to 105° F. or higher, and returns to the normal point in a continuous line. The intervals between the seizures have not the same well defined, quotidian, or tertian characters as in intermittent fever, but have a varying duration from days to weeks.

The last named temperature types, the *intermittent* and *relapsing* are sometimes closely simulated by the occurrence of sudden exacerbations in the course of various acute diseases, depending on an extension, or complication of the local affection ; in these cases, however, the temperature in the intermissions is never that of perfect health.

The march of the temperature in *chronic* diseases when they are accompanied by fever, resembles that of the *remittent* type, with morning remissions and evening exacerbations, the morning temperature being slightly above the normal, the evening temperature indicating a considerable degree of fever. In another class of cases the type is intermittent, the morning temperature being normal, that of the evening high ; more seldom the intervals of apyrexia are of one or more days duration, during which time, both morning and evening temperatures show no change from the healthy standard. Both these temperature types are frequently met with, as in those cases of pneumonia which lead to pulmonary phthisis, and in the chronic inflammatory diseases of the abdominal organs. There still remains to be mentioned a somewhat rare form of temperature course, the *inverted type,* occasionally observed in phthisis and other diseases ; in it the remission takes place in the evening, the exacerbation in the morning.

Relation of the range of temperature to the amount of excreta where fever is present.—Professor Atkins states that Virchow's ; Wunderlich's, and Parkes', conclusions on this subject, were, that the morbid development of heat as *measured* by a *thermometer,* is associated in some cases with *more* abundant, in other instances with *less* abundant excreta from the body than in health ; that the temperature and the amount of the excretions bear some undetermined relation to each other ; and that the loss of weight of the patient is due to increased, and rapid elimination of material, with increased tissue change, associated with the increase of temperature. That a diminished excreta in fever is to be referred to retention of such excreta, and not to a want of formation ; and that while the amount of excreta (capable of being measured), may in fact be small, the amount of tissue change may nevertheless be great.

Points to be noted in cases of fever.—The history especially with reference to residence, exposure to *contagion* or *infection*, mode of life, previous habits, and previous attacks of fever; immediate or exciting cause; the state of health before the attack; the period of incubation; the prodromata; the mode of invasion; the date of first appearance of fever; the character of the paroxysms and their duration; the date of the appearance of an eruption, if present; the date of the appearance of secondary diseases, if any; the present state, appearance, decubitas, expression; make a complete systemic examination. Give the diet and treatment in detail. Note the daily progress, the effects of treatment; the temperature both morning and evening, and if there are paroxysms at other times, take the temperature especially at their height; (*acme*); the state of the radial pulse, and of the impulse of the heart, the character of the cardiac sounds, the state of the respiration and its ratio to the rate of the pulse. Examine the skin, the heart, the lungs, the urine, and the motions daily in cases of continued fever, and the state of blood from time to time. Carefully note all complications, as of the respiratory, circulatory, urinary, digestive or cerebro-spinal systems, the date of their appearance and their causes; note the progress of emaciation; the day of the disease, the character of eruptions if present, the dates of their appearance and disappearance and the changes they undergo. Note the mode of termination of the attack by "crisis," "lysis" (insensible resolution) "imperfect crisis with lysis," "remittent defervescence;" critical or post critical evacuations. Note the character of convalescence. If there be a relapse, note the cause. Note the mode of death in fatal cases as from "syncope," "coma," "asthenia" or associated diseases. When a *post-mortem* examination is made, describe the anatomical appearances, the changes in the tissues, in the blood, and in the different physiological systems.

CHAPTER VIII.

ON THE DIAGNOSIS OF SKIN DISEASES.

Diseases of the skin are often looked upon by students as being very obscure, they are not so, and if they take the trouble of understanding, and using, the following very useful Charts of Dr. Tilbury Fox, they will find that the differential diagnosis of such diseases is not impossible.

They should first learn thoroughly Sections III on the elementary lesions, and IV on the general causes of skin diseases, then they will be able to find under which group in Section II the particular case comes, remembering that the disease may be complicated, or that one or more of the groups may be represented on the same skin. The eruptions of the acute specific diseases are always accompanied by the characteristic symptoms of the particular disease. The lesions seen in the different diathetic states (Section II, group 2), are often very mixed, the previous history of the case, and the presence of the general symptoms, and signs, characteristic of the particular states, will settle the question. The student should remember that the parasitic diseases (Section II, group 9) flourish in the skins of people suffering from the debilitating influences of such diseases as scrofula, syphilis, leprosy, and malarial cachexia.

The local inflammations (Section II, group 3) must be recognised by observation. If such eruptions exist with any marked cachexia, or any of the diathetic states in group 2, the general state of the system should be noted.

With reference to the other groups it is only necessary for the student to remember that skin diseases of any kind rarely show themselves in healthy people—*vide* Causes Section IV.

The subject will be found more fully dealt with in Dr. Fox's large work on diseases of the skin.

The recognition of diseases of the skin amongst the darker skinned races of India is a little more difficult than amongst the fairer, or amongst Europeans. Their customs regarding washing, &c., the underfeeding in some parts of the country, the prevalence of constitutional syphilis, the effects of exposure to malarial influences, the overcrowding in the towns, and the consequent difficulty of obtaining sufficient water for ablution, form the principal causes of diseases of the skin amongst natives. In examining skin diseases, the use of a small pocket lens often facilitates the observation.

SECTION I.—RULES FOR OBSERVING.

1. A diagnosis should be based upon the phenomena or features presented by any skin disease as a whole.

To obtain these data (*a*) all diseased places, or as many as possible, should be carefully examined, since the eruption may be at very different stages of development, and therefore present very different aspects in different localities, in the same subject. During this examination attention should be directed—*firstly*, to the new points of disease, or to the extending edge of a diseased patch, with a view to determine the character of the origin of the disease; and *secondly*, to the stages, if any, through which the eruption subsequently passes. (*b*). Where the earlier stages in any given disease are not recognizable, careful enquiry should be made into the history of the case as to the nature and characters of past changes.

By attending to these two rules, the observer ascertains the elementary lesions (see Section III), and the characters of the stages of diseases: and these he should in each case combine together, so as to form a diagnostic picture of any given malady.

2. It should not be forgotten that one disease may be complicated by another. Certain diseases are naturally multiform in aspect, especially scabies and syphilis; but excluding these two, practically speaking, multiformity indicates complication.

3. Diseases, it should be remembered, are variously modified by a number of influencing conditions. For particulars, see Chart of Causes, Section IV, A. *c*.

4. The observer is not to expect to meet with *peculiar* pathological changes in the skin, but changes essentially the same as in the other organs of the body.

Now to proceed to indicate what the various skin diseases are, how they may be grouped, and what are their several characteristic features. Whatever be the eruption which comes under observation, it must belong to one or other of ten easily recognised clinical classes, the particulars of which are set forth in the succeeding section.

Section II.—Classified Chart of Eruptions.

1. Eruptions of the acute specific diseases.

Embracing: The *variolous* eruption and *roseola variolosa, vaccinia,* and *roseola vaccinia ;* the *eruptions* of *typhus, typhoid, rubeola, scarlatina, erysipelas, equinia,* and *dengue.* These are all important in reference to the differential diagnosis of the skin diseases ; but the eruption in these cases (unlike those of true skin diseases) is manifestly unimportant compared with the gravity of the general condition and the high temperature.

2. Eruptions.—*The Local Manifestations of* DIATHETIC STATES.

Scrofuloderma, or Scrofulous Inflammation of the Skin, characterized by indolent livid nodular swellings, softening up into unhealthy pus, and giving place to crusting and ulceration, with general indications of struma.

Syphilodermata, or syphilitic eruptions, comprising : roseolar, papular, tubercular, squamous, and pustular syphilides ; Syphilitic acne, herpes, and pemphigus, rupia, ulceration, gumma, &c. These are often intermingled, and are parts only of a series of syphilitic phenomena in the way of cachexia, affections of the skin, mucous membranes, bones, and other visceral diseases.

Leprous Eruptions, consisting of dull red blotches, under which tubercles form : or red patches, becoming the seat of bullæ ; or red, dry, slightly scaly circular patches —all patches being anæsthetic.

Eruptions occurring in connection with Endemic Cachexiæ, such as Delhi Boil, Aleppo Evil, Framboesia, &c., too special to be dealt with here.

Purpura Hœmorrhagica.

3. Local Inflammations, comprising.

Erythematous inflammation ; chief feature, hyperæmia in patches or diffused, and disappearing on pressure.	*Erythema* ...	With or without effusion, giving rise to soft papular or tubercular elevations.
	Intertrigo ...	In folds of skin, with discharge.
	Roseola ...	Of rosy hue and patchy.
	Urticaria ...	With wheals. Eruption rapidly comes and goes.

Catarrhal, characterized by serous effusion into papillary layer running on to sero-purulent discharge and crusting; skin thin, palid, and sensitive.	*Eczema* ...	With stages of redness, papulation, vesiculation, pustulation, discharge, crusting, squamation, &c.
Plastic, essentially papular; due to plastic lymph in papillary layer or deeper dermic layer. Skin generally dry and thickened.	*Lichen* ...	Papules small, pale, scattered or in circumscribed patches.
	Lichen planus...	Papules red, with flat glistening tops, separate at first, then in patches.
	Prurigo ...	Papules large, few, and scattered, itching intense.
Bullous, chief feature the development of blebs.	*Herpes* ...	Bullæ small, chambered, and clustered on red base.
	Pemphigus ...	Bullæ large and isolated.
	Hydroa ...	Bullæ small, developed from papules, with pruritus.
Suppurative, essential lesion pustules.	*Impetigo contagiosa.*	Pustules from vesico-pustules, superficial, painless, and isolated.
	Ecthyma ...	Pustules on a red, hard, painful base.
	Furunculus ...	Pustules deep-seated and painful, with a "core."
Squamous, characterized by hyperæmia and hyperplastic growth of cuticle.	*Pityriasis rubra*	Hyperæmia diffuse in derma, and flakiness affecting entire surface.
	Psoriasis ...	Hyperæmia of papillary layer, with cuticular hyperplasia, in patches.

4. HYPERTROPHIC AND ATROPHIC DISEASES.

A. *Hypertropic.* Epithelial layer mainly affected.	*Pityriasis* ...	Branny scaliness.
	Warts, corns ...	Circumscribed change.
	Xeroderma and Ichthyosis.	Congenital disease, with altered sweat and sebaceous functions, and with papillæ often hypertrophied.
Connective tissue of the skin specially implicated.	*Keloid*	Contractile sessile outgrowth.
	Fibroma ...	Soft pendulous outgrowth.
	Morphœa ...	Condensation, wax-like.
	Scleroderma ...	General firm induration.

B. *Atrophic Senile atrophy, Linear atrophy, General marasmus.*

5. NEW FORMATIONS.

Characteristic, being the growth of a new tissue in the form of tubercles.	*Lupus*	Growth soft, vascular, and composed of granulation tissue. Disease of early life.
	Cancer... ... *Rodent ulcer* ...	Disease of late life: hard, indurated growth, made up of epithelial elements, or proliferating connective tissue cells.

6. HÆMORRHAGE (Cutaneous).

Effusion of blood uninfluenced by pressure, in points or in blotches. *Purpura.*

7. NEUROSIS.

In which the nerves are primarily disordered and there are no organic changes at the outset.	*Hyperæsthesia*...	Excess of sensibility.
	Anæsthesia ...	Diminution of sensibility.
	Pruritus, Dermatalgia, &c.	Altered sensation.

8. PIGMENTARY ALTERATIONS.

Consisting primarily of deposits or alteration of pigment. Pigmentation secondary to other diseases is not included here.	*Melasma* ...	Excess of color.
	Leucopathia ...	Diminution of color.
	Xanthoderma, &c	Alteration of color.

9. PARASITIC DISEASES, comprising.

A. *Animal*	*Scabies* ...	due to	Acarus scabiei.
	Phthiriasis ...		Pediculus vestimentorum.
	Pruritus Eczema, &c.,		Pediculus pubis. Pediculus capitis.
	Pruritus, Urticarial conditions, Erythema, &c.		Gnats, fleas, bugs.
B. *Vegetable*	*Tinea favosa* ...		Achorion Schönleinii.
	Tinea tonsurans *Tinea circinata* *Tinea kerion* ...		Trichophyton tonsurans.
	Tinea versicolor		Microsporon furfur.
	Tinea sycosis ...		Microsporon mentagraphytes.
	Tinea decalvans		Microsporon Audouini.
	Onychomycosis		Trichophyton or Achorion.

For plates of some of the more common of these Parasites, see the Chapter on the use of the microscope.

10. DISEASES OF THE GLANDS AND APPENDAGES. Divisible into.

A. *Diseases of the Sweat Glands and Follicles.*	*Hyperidrosis* ...	Excessive secretion.
	Anidrosis ...	Diminished secretion.
	Chromidrosis, Osmidrosis.	Altered secretion.
	Miliaria, Sudamina, Lichen tropicus, Strophulus, Dysidrosis, Hydroadenitis	Congestive and inflammatory.
	Sweat cysts ...	Cystic.

B. Diseases of the Sebaceous Glands and Follicles.	*Seborrhœa*	Excessive secretion.
	Asteatodes	Diminished secretion.
	Allosteatodes, Xanthelasma.	Altered secretion, with or without retention.
	Molluscum, Horns.	Retention of secretion, without inflammation.
	Acne	Inflammation of gland, with slight retention of sebum.
C. Diseases of the Hair and Hair Follicles.	*Hairy nævi, Moles, Hirsuties.*	Excessive growth.
	Alopecia	Diminished growth; partial or absolute baldness.
	Fragilitas	Textural alteration.
	Sycosis	Inflammation of follicles.

D. *Diseases of the Nails*, including: Changes occurring in syphilis, lichen ruber, general eczema, psoriasis, pityriasis rubra, struma. Inflammation of matrix, as in onychia. Parasitic disease termed onychomycosis, caused by the favus parasite, or the trichophyton. Hypertrophy, atrophy, and corn of the nail.

This Chart is so arranged as to serve two useful purposes:—

In the *first* place, it indicates ten general groups, into which all eruptions observed on the skin may be arranged, and these groups are shown by the numbered headings on the left-hand side.

In the *second* place, the table defines the particular class to which eruptions belong, and the main diagnostic features of these classes, as well as the diseases themselves.

For instance: Roseola is an erythematous inflammation of the skin in patches, and of a rosy hue. Herpes is a local inflammation of the skin, characterized by the formation of bullæ, these bullæ being small, chambered, and seated upon a red base. Pityriasis rubra is a local inflammation of the skin, characterized by hyperæmia and hyperplasic growth of cuticle, this hyperæmia being diffused generally, and the flakiness affecting the entire surface. Hyperidrosis is characterized by excessive sweating, and so on.

The student preparing for examination may refer to the table with much benefit, if only to finally refresh his memory upon salient points of skin eruptions; and its mental use should always be had recourse to as an analytical aid in every case in making a diagnosis.

SECTION III.—*A.* ELEMENTARY LESIONS.

Having now indicated in the preceding Chart the general nature and main characters of the various skin eruptions, it is necessary to describe in brief terms the elementary lesions, or the types of form and aspect, presented by these eruptions. The student is required to know these at examinations, and this description of them will constitute a general outline of the pathology of the skin.

The Elementary Lesions are nine in number, *viz.* :—maculæ, or stains; redness, or hyperæmia; wheals; papules; vesicles; bullæ, or blebs; pustules; squamæ, or scales; and tubercles, or large papules.

Maculæ or stains may be:—

a. Pigmentary, due to presence of pigment in excess. (See Section II, group 8.) These may be *secondary* to other diseases, as in syphilis; or physiological, as in pregnancy; or parts of certain cachexiæ—ex., Addison's disease or leprosy. They may be *primary* or *idiopathic,* generally the remnant of hyperæmia caused by irritants.

b. Chemical stains from iodine, silver, bile, acid, &c.

c. Parasitic, due to the presence of fungus elements, as in tinea versicolor (see Section II, group 9).

d. Hæmorrhagic, as in purpura, due to extravasated blood (Group 6).

Redness or Hyperæmia (see Group 3) may be active (arterial), or passive (venous). Active hyperæmia consists of redness, removable by pressure; it may be punctiform or patchy; it is often accompanied by swelling from effusion, as in erythema papulatum; by disordered sensation—ex., pruritus: by slight rise in temperature: and is often followed by desquamation, and occasionally exudation. It is caused by local irritants, Section IV, B. I; by changes in the blood, ex. Section IV, A, *c*; or nerves, *e*.

Wheals are raised by hyperæmic swellings that have a palish centre, and rapidly form to as rapidly disappear. They are typically portrayed in the sting of the nettle. It is supposed that they are caused by sudden dilatation of a bunch of capillary vessels and escape of serosity. They are accompanied by heat and great tingling. Some suppose the vessels beyond the point of dilatation are in a state of spasm. Wheals are characteristic of urticaria. (Section II, group 3.)

Papules, or pimples, are little solid formations in the skin. They are of different kinds—(1) those due to hyperæmia of the papillæ, forming bright red points (Strophulus, Group 10); (2) those consisting of hyperæmic, turgescent, and erected follicles, as in lichen tropicus (Group 10); (3) papules, due to deposit of lymph or the like about the walls of the follicles, as in lichen planus (Group 3); (4) those which are solid lymph formations or cell growths, in the derma proper, as in linchen, prurigo, and syphilis; (5) those due to epithelial collection in the follicles, as in pityriasis pilaris; and (6) those formed by hypertrophy of normal structure, as in papillary warts (Group 4).

Vesicles are upliftings of the cuticle into a minute bladder by fluid, sweat, or serosity. Vesicles are solitary or compound. Solitary vesicles, due to sweat between the strata of the horny layer of the cuticle, are seen in *sudamina* (Group 10). Solitary vesicles, formed by serosity between the horny and mucous layers of the cuticle, are found in pemphigus (Group 3). All others are compound, and the fluid is collected in loculi, formed by the stretched-out cells of the rete, as in variola (Group 1), herpes (Group 3), erysipelas (Group 1), blister and eczema (Group 3). Further, in sudamina, blister, and pemphigus, the fluid is serous; in variola, eczema, and herpes, exudation and pus cells are present in the rete, in the papillæ, and in the corium.

(Group 3) are simply large vesicles, and their structure the same. In syphilis (Group 2) bullæ may occur, and then the contents become sanious, whilst ulceration is superadded, but usually the bullæ become tense, with clear contents, then their contents get opalescent, the bullæ become flaccid and shrivel away, leaving only a red mark, without change in the cutis.

Pustules are elevations of the surface by pus rapidly formed. They are accompanied by more inflammation than vesicles, and by a deeper affection of the tissues, but the loculi containing pus are similar in structure to those of vesicles. The clinical varieties are described in Chart. (Section II, group 3,) under Local Inflammations, sub-head "Suppurative."

Squamæ, or scales, are formed of detached epidermic cells. They differ from crusts, which are caused by dried discharge. Scaliness occurs as a secondary consequence in all inflammatory skin diseases, but as a more essential part of the disease in squamous inflammation—ex., psoriasis and pityriasis rubra—and in hypertrophic conditions; see respectively for details Chart (Section II, groups 3 and 4) under heads of Squamous Inflammation, and Hypertrophic States.

Tuberculum.—A solid fleshy lump in the skin, formed of a new growth of tissue: *homologous*, as in keloid and fibroma, in which the connective tissue is involved, see under Hypertrophic Diseases (Group 4); or *heterologous*, as in the Group 5 or New Formations.

B. SECONDARY CHANGES.

There are certain "Secondary Changes" deserving of notice. They are:—

Crusting, in which crusts form, and these crusts are due to the drying up of discharge, poured free upon the surface through the inflamed derma, as in eczema; or contained in bullæ; or given out by an ulcerated surface; or they may be due to sebum collected into mass; or to fungus elements, as in favus. Crusts formed from the escape of serum are thin and bright-coloured. Crusts formed from dried pus are thick and yellow. Crusts from drying up of bullæ are, as the rule, thin and slightly dark. Crusts from the drying of sanious pus from ulcers, are thick, dark-colored, and heaped up. Sebum crusts are flat, easily detached, and greasy. The favus crust is pulverulent, honeycombed, and sulphur-yellow.

Ulceration is the result of cachexiæ, such as the strumous or syphilitic: or of new growths replacing the normal textures, and themselves softening and decaying, as in lupus and cancer: or from softening of actual outgrowths from the skin, as in fibroma and yaws.

Excoriation is due to scratching. Its seat is suggestive—on the front of the forearms and the thighs, of scabies; and about the clavicles and shoulders, of phthiriasis.

Scars are left by traumatic injuries: caustics: and by certain diseases which ulcerate, such as variola, furunculus and anthrax, pustula maligna, strumous and syphilitic disease.

Having so far described the various eruptions of the skin with their types of form, and their pathological and clinical features, it is necessary to give a classified List or Chart of their causes in general.

SECTION IV.—GENERAL CAUSES OF SKIN DISEASES.

The Causes may be conveniently arranged under two heads—*viz.*, those which act from within, and those which act from without upon the skin; or Internal and External Causes.

A. INTERNAL CAUSES.

a. *Hereditary Tendency.*—This may give rise to a general disease—ex., struma or ichthyosis; or a local disease—ex., warts, fibroma.

b. *General Debility,* which acts as a potent predisposing cause.

c. *Blood poisoning or Impurification,* by special animal poisons inducing acute specific diseases; by deficient excretion and undue retention of excreta—biliary, renal, or intestinal—giving an acrid character to the blood; by long continued dyspepsia, which acts similarly and induces debility; by the presence of medicinal substances in the blood—ex., bromide of potassium, or animal poisons of special kind—ex., syphilitic virus, or that derived from eating shell-fish, &c.; by accumulation of uric and lactic acids in gout and rheumatism, imparting an inflammatory character to skin diseases; by the accidents of poverty, which deprave the blood-current and lead to cachexia; by the non-performance of natural functions—ex., perspiration, by which more work is thrown upon the skin; by organic diseases of excreting organs—ex., liver, leading to retention of excreta; and by dietetic evils. [These conditions are specially important in regard to the inflammatory diseases of the skin comprised in Group 3 and Group 10, Section II, and are referred to in relation to the treatment of these inflammations in the Therapeutic Chart, Section VI.]

d. *Diatetic Dispositions,* in which a local is but the index to a general state of malnutrition, as in struma or leprosy.

e. *Nerve Disturbance,* which acts in four ways: *firstly,* by inducing change in the calibre of vessels and so altering the supply of blood and favoring transudation of fluid; *secondly,* by directly causing tissue-change, cell-proliferation, &c., as in herpes and prurigo; *thirdly*, by the loss of regulation of nutrition which follows nerve debility; *fourthly*, by the transmission of irritation through the reflex function by which eruptions may be excited or aggravated, as in the case of acne combined with dyspepsia.

f. *A disposition on the part of the tissues themselves to become diseased*, as exemplified in the case of simple *plus* and *minus* conditions of nutrition, where it would seem that the tissues themselves exhibit a morbid activity of growth, as in fibroma, keloid, and even cancer and lupus.

g. *Climatic or Endemic Influences*, by which the nutrition of the body as a whole is depraved, and skin disorder is the consequence.

B. External Causes.

Some of these influence for evil the general health, and so disorder the skin indirectly; others act directly upon the skin.

1. Amongst the external causes acting directly upon the skin the most important are:—

Scratching, which may excite and always aggravates disease, and may, in contagious cases, spread it from place to place, as in scabies and contagious impetigo.

Local irritants of all kinds—ex., cold, heat, friction, flannel worn next to the skin, irritants, plasters, fluids, and applications of all kinds; irritating substances, such as lime, sugar, flour, washing-soda, producing bricklayers', bakers,' grocers,' and washerwomen's itch; unwholesome handicrafts; dyes, contusions, animal and vegetable parasites of all kinds; medicinal applications, all of which may excite or aggravate disease.

Want of care of the skin in the dirty and ill-fed.

2. Amongst the external causes that act indirectly upon the skin through their influence upon the general health may be mentioned:—

Want of cleanliness, climatic influences, defective clothing, neglect, and the like; animal poisons inoculated into the skin, &c.

Clinically it is of the highest importance to remember, *first* that these several causes vary in character: they may be *predisposing*, or *exciting*, or *producing*, or *aggravating*; and *secondly*, that the real cause of any given skin disease is often made up of a number of these agencies in combined operation. Illustration: Eczema may occur in a cook, a rheumatic subject, who is exposed to the irritating influence of the fire, and in connexion with a blood-current charged with retained excreta, the consequence of inefficient bowel and kidney action.

SECTION V.—THERAPEUTICAL HEADINGS.

THERE are three varieties of treatment—Local: General: and a mixture of Local and General.

Local remedies, comprising astringents, absorbents, caustics, parasiticides, and operative measures are required in Groups 4, 5, and 9 (see Chart, Section II).

General—chiefly tonics and mercurials—in Groups 1 and 2.

The mixed treatment is required in the other Groups. Of these latter, Groups 6, 7 and 8, and most of the components of 10, need only general tonics. Group 3 includes the inflammatory diseases, which are by far the most frequent in occurrence, and in fact constitute the bulk of cases that demand treatment.

This Group 3, as will be seen from the Diagnostic Chart, comprises Erythema, Intertrigo, Urticaria, Eczema, Furunculus, Pityriasis rubra, Psoriasis, Lichen, Prurigo, Pemphigus, Herpes, Ecthyma: and in dealing with these, and the inflammatory affections comprised in Group 10, particularly Acne, Sycosis, and Dysidrosis, the following points should be especially attended to:—

Local Treatment—Wherever hyperæmia is marked or active, soothing remedies are called for, whilst the operation of irritants (see list of external causes, Section IV) should be avoided, and the air excluded: and not until the stage of hyperæmia is passed should stimulating and other remedies be used.

General Treatment.—The following conditions must be taken into consideration in framing the internal treatment of these inflammatory diseases, it having been settled first of all whether or no the disease is uncomplicated. These conditions before referred to, see A in list of causes, Section IV, exist in varying combination :—

Influence.	*Its Action.*	*Specially observed in.*	*Treatment.*
Debility, including Anæmia.	It retards recovery from want of recuperative power in the system. All functions share in the debility.	Furunculus. Eczema. Pityriasis rubra. Pemphigus. Ecthyma.	Tonics. Mineral acids Iron. Quinine. Cod oil. Arsenic. Food.
Dyspepsia	Induces debility. Leads to liver disturbance. Impurifies blood current. Increases hyperæmia by reflex action (acne).	Eczema. Urticaria. Acne. Sycosis.	Antacids and bitters. Regulation of diet. Fresh air.
Retention of Excreta from kidney, liver, and bowel inactivity.	Gives the blood an irritative quality and aggravates hyperæmia.	All inflammatory skin diseases.	Quicken elimination by Diuretics, Aperients, and Cholagogues.
	Leads, in the case of kidney torpor, to increase of watery fluid in tissues.	Eczema of legs.	Diuretics.
Constipation	Gives rise to dyspepsia. Liver torpor Retention of excreta.	All forms.	Aperients.
Diabetic state	Increases inflammatory character; favours phlegmonous inflammation, and leads to freer development of disease, and to chronicity.	Eczema. Psoriasis. Intertrigo in adults. Furunculus. Anthrax.	Anti-Diabetic.
Repression of special normal eliminatory functions, Skin, and Menstrual.	Compensatory elimination demanded of skin, which may fail to respond, and so become diseased. In dependent parts this leads to increase of fluid in tissues.	Furunculus. Ecthyma. Eczema.	Vapour and other baths. Sudorifics, Aloetics, and Tonics.
Gouty and Rheumatic Diathesis.	Causes accumulation of uric and lactic acids and allied compounds in blood, giving an inflammatory character to disease by increasing hyperæmia.	Eczema. Psoriasis. Lichen. Ecthyma. Sycosis. Urticaria.	Gouty remedies, combined with those appropriate for the skin disease.

Influence.	*Its Action.*	*Specially observed in.*	*Treatment.*
Strumous Diathesis.	Imparts an unusual purulent character to eruptions, and favors implication of connective tissue.	Eczema. Psoriasis. Acne. Sycosis.	Cod-liver oil always required.
Syphilitic Taint.	Tends to induce induration from presence of syphilitic tissue; or ulceration, cachexia, and general debility.	Eczema. Psoriasis. Pemphigus. Ecthyma. Acne. Intertrigo (infants).	Antisyphilitic remedies must be combined with others, or used in first instance alone. General tonics needed.
Diet, Errors of.	Introduces special irritative substances into blood; causes dyspepsia; leads to accumulation of nitrogenous matters in system, to liver disorder, &c.	All forms of inflammatory eruptions without exception.	Regulation of diet according to circumstances.
Hygiene, Lack of.	Disposes to torpor of skin, and favors occurrence of morbid action and disease.	Acne and Sycosis. Eczema. Intertrigo. Erythema especially.	The use of baths, ablutions, proper clothing, & the like.

These several conditions or influences exist in varying combination, just as do the component elements of the causes of many Skin Diseases, and the skill of the physician is shown in estimating aright this combination in its different details in any given case; for upon this the treatment must be based. One illustration will suffice. Eczema may occur in a gouty and dyspeptic subject, whose blood-current is unduly charged with nitrogenous excreta, and who has been iudulging too freely in stimulants.

It will be observed how many of the influences referred to in the Chart increase hyperæmia of the skin. Now, hyperæmia must, before anything else is attempted (especially when it is active in character) be repressed; and this may be done partly by local means, before referred to; by augmenting the action of the kidneys, and by preventing the operation of those influences that increase hyperæma. This is the most important point to be attended to in the early treatment of inflammatory Skin Diseases, because generally all that is needed afterwards is the exhibition of tonics internally, and the use of astringents and stimulants locally.

CHAPTER IX.

POINTS TO BE OBSERVED IN DISEASES OF THE NERVOUS SYSTEM.

In the diagnosis of this class of diseases you have to trust much to the symptoms present. Be most particular in taking the history of the case from the patient, or his friends, and carefully trace out any hereditary tendency to diseases of this kind, inquire whether any relatives have ever suffered from any form of nervous affections such as dementia, idiotcy, epilepsy, chorea, neuralgia, asthma, &c., &c., look out for signs of constitutional taints, such as syphilis, leprosy or malarial cachexia. Find out whether the parents were near relatives, or if there has been much intermarriage in the family, also, to what race the respective parents belonged. Be particular in finding out if it is the first attack, or whether the patient has before suffered from any form of nervous disease. Find out exactly how and when the first symptoms set in, and what they were. The occupation of the sufferer often throws light on such diseases, as the paralysis of lead poisoning, or the curious forms of mental distress found in people who are overworked, or exposed to much mental worry. The habits of the patients as to temperance regarding food, alcohol, the use of opium, Indian hemp, chloral, strychnine, or sexual intercourse often throw light on the case.

The symptoms that should lead you to suspect disease of the nervous centres, (brain and spinal cord), are, any alterative in the mental functions, or in the powers of motion or sensation, severe or long continued pain in the head or spine, affections of the sight, hearing, smell, or taste, unconnected with structural changes in the organs through which these senses are manifested. In the progress of any case all the functions of the nervous system may be implicated, but by inquiring into the history of the disease, you will generally find which has been most prominently affected. It is important to remember in all such cases, that brain symptoms may result from changes in the brain itself, or from changes in the blood, or blood current; and therefore you should seek first for special disordered states of the blood, as uræmia.

Dr. Fenwick has made the following division of diseases of the nervous system in his Manual on Medical Diagnosis.

(*a.*) *Alteration in the mental condition.*—The mental powers may be either partially or wholly suspended as in *coma.* In deep *coma* the patient can neither answer questions, nor is he sensitive to light or other stimuli, the breathing is heavy, often snoring, swallowing is difficult or impossible. They may be in a state of high activity, the patient constantly talking in a rapid, rambling manner, constantly changing his position, restless, and often violent, as in *delirium.* In such cases the previous history of the case, and an accurate examination of the different physiological systems, is the only way in which you can arrive at a diagnosis of the cause. When coma is present, you have to settle whether the patient is suffering from apoplexy (cerebral hœmorrhage), embolism, injury to the brain, uræmic poisoning, poisoning from alcohol, or other narcotics, sunstroke, or catalepsy; when delirium is present, you have to settle whether it is due to insanity, fever, meningitis, poisoning as from Indian hemp, stramonium, belladonna, &c. In both note always the state of the pulse, respiration, temperature, the mode of breathing, the smell of the breath, the presence or otherwise of squinting, state of the pupils, the presence of convulsions, state of bladder, and rectum; always examine such cases for injuries of the head, disease of the heart, or kidneys; in the delirious, note the kind of delirium, whether constant or not, carefully examine the different physiological systems and note any changes. Note the power of locomotion. In both of these class of cases the use of the opthalmoscope often throws much light on the pathological state of the brain from what can be observed in the retina; other alterations in the mental condition are more fully dealt with in the following chapter.

(*b.*) *Alterations in the power of motion, or sensation,* diminished or lost, (*paralysis* or *palsy*) increased or involuntary (*spasm* or *convulsion.*)

Tanner gives the following definitions of the different forms of paralysis. "In *complete* or *perfect* paralysis both motion and sensation are affected; in *incomplete* or *imperfect* paralysis, either motion or sensation is lost or diminished. *Imperfect* paralysis is divided into *acinesia*—paralysis of motion, and *anæsthesia*—paralysis of sensation. Again, the paralysis may be *general* or *partial,* as it affect the whole body or only portion of it. *General paralysis,* or complete loss of sensation and motion of the whole system, cannot take place without death immediately resulting; but this expression is usually applied to palsy affecting the four extremities, whether any of the other parts of the body are affected or not. *Partial paralysis* is divided into *hemiplegia* when it is limited to the lateral half, and *paraplegia* when it is confined to the inferior half of the body. The term local *paralysis* is used when only a small portion of the body is affected, as the deltoid, pectoralis major, or a single limb. The term *reflex* paralysis is now used to indicate that variety of paralysis which is dependant upon disease in some other part—urinary, uterine, or intestinal—not directly connected with the paralysed part itself. It is induced through the reflex agency of the spinal cord. Paralysis may be hysterical.

When there is loss of muscular power, you direct the patient to move the palsied part, and the muscles are seen to obey his will imperfectly, or not at all; thus, one side of the face being paralysed, you ask him to laugh, and you will see the mouth drawn to the opposite side. In some cases you test whether the reflex action is intact, as for instance, by tickling the sole of the foot and observing if the leg is drawn up involuntarily, or, by striking on the tendon of the patella when the leg is hanging loose and bent, in order to see if the rectus contracts. In others you apply electricity to ascertain if the muscles are able to respond to the stimulus. Always remark whether, with the palsy, there are cramps, or contractions of the muscles, and if so, at what stage of the disease they have occurred.

Sensation is often impaired when the power of motion is affected, as the nerves contain both motor and sensory fibres. You ascertain this by inquiry, or for greater exactness you measure with a pair of compasses the smallest distance to which the points can be separated while the patient is sensible of the contact of both. The muscular sense may be impaired though the sensibility of the skin is perfect. In this case the movements of the part affected are, awkward and irregular, and can only be performed when the will is strongly directed to the object, or when the muscles are assisted by the eyesight, *loss of co-ordination of motion.*

In such cases always note all affections of the nerves present, and especially the state of the muscles as to atrophy or hypertrophy, the state of the mental powers, and the general constitutional state. Always examine the skull and spine for any abnormal sign, and the course of the affected nerves for any injuries, or enlargements. Note the temperature in the axilla, and also, over the surface of the affected part.

Increased and involuntary muscular action.—When it only affects particular muscles it is called *spasm;* when excessive and involuntary muscular action is general and attended with unconsciousness, it is called *convulsion.* Spasms, again, may be "*tonic*"—that is, continuous, or, "*clonic*"—that is, alternating with intervals of relaxation. Convulsions occur at all ages, and in different diseases. Children are most liable to them, at an early period of life they often usher in eruptive fevers, or they may be produced by teething, worms, or other causes of irritation. They also occur in various diseases of the brain, poisoning from certain vegetable substances and in certain states of the blood as seen in albuminuria and sunstroke.

In such cases always note the muscles affected and any other affections of the nervous system which may be present. Note the state of the nutrition of the affected muscles, and of the muscular system generally, also the general constitutional state. The history as regards occupation hereditary tendency, constitutional taint, duration of illness, may throw much light on these cases.

(*c.*) *Cerebral headache, pain in the spine, vertigo, vomiting or retching, affections of the special senses.*—Headache depending upon disease of the brain, or pain depending upon disease of the cord, are characterised by their persistency, the latter will generally be accompanied by other symptoms pointing to disease of the cord, in all such cases the spine should be carefully examined.

Cerebral headache is characterised by its intenseness and persistence, it is often accompanied by some of the following symptoms, cerebral vomiting, convulsions, confusion of mind, vertigo, noises in the ear or flashes of light in the retina. The pain may be sharp, or dull, or lancinating, or throbbing, it is generally more severe in diseases of the meninges than in those of the brain substance. It is sometimes the only symptom of constitutional syphilis. You should always closely examine for affections of the cerebral nerves.

Cerebral vertigo, giddiness, circumgyratis.—Any disturbance of the cerebral circulation will produce giddiness, that depending on disease of the brain is generally accompanied by other cerebral symptoms. When giddiness, vomiting and confusion of ideas alone are present, great care should be taken in examining, the middle and internal ear for signs of disease (Menière's disease.)

Cerebral vomiting is very persistent, without any apparent cause, great effort or fatigue, little or no nausea or abdominal pain, constant retching, the stomach rejects everything. The food is rejected unaltered, sometimes mixed with mucus and a little blood, sometimes there is a desire for food which cannot be retained, the tongue is clean, the breath pure, the conjunctiva colourless, there is often headache, vertigo, or some affection of one of the special nerves.

Affections of the special senses.—When the functions of any of the nerves of the special senses are affected due to disease of the brain, there is generally some other sign of cerebral disease to help the diagnosis, as for instance, some paralysis of the other cerebral nerves, or there may be cerebral headache, vomiting, or vertigo.

Loss of the sense of smell is called *anosmia ;* blindness from paralysis of the retina or optic nerve, *amaurosis ;* insensibility to the impression of sounds (deafness), *cophosis ;* loss of taste *agenstia.*

The changes in the eye in tumours of the brain as observed by the opthalmoscope are either produced by optic neuritis, or by atrophy of the optic nerve. In many cases the patient has no diminution in the powers of vision, so that the opthalmoscope should be employed in all cases where "coarse" cerebral disease is suspected. According to Von Graefe, "the engorged papilla is chiefly distinguished by great, but perhaps partial swelling and prominence of the disc, numerous and considerable hæmorrhages on and around the papilla ; and great dilitation, darkness, and tortuosity of the veins ; the arteries being on the contrary, very small, attenuated, and often almost bloodless. The inflammatory infiltration of the retina is confined to the close vicinity of the nerve entrance."

Soelberg Wells says, "The opthalmoscopic symptoms which especially characterise atrophy of the optic nerve are, a pale blue or bluish-white discoloration of the papilla, diminution in the calibre, and number of the little nutrient blood-vessels upon the expanse of the disc, attenuation of the retinal vessels, more especially the arteries, and frequently a peculiar excavation of the optic nerve."

Double optic neuritis is often seen in obscure tumours of the brain.

The following table modified from Dr. Woodman's,[1] will be found useful in giving the student some idea of the seat of the lesions in the brain and spinal cord in cases of paralysis, but he must remember, that good as the work is, which has been done regarding the localization of the functions of the different portions of the brain and spinal cord, the whole question is still under examination.

SYMPTOMS.	SEAT OF LESION.
THE CRANIAL NERVES (FOSTER)[2]	
1st. *Olfactory.*—Nerve of smell, disputed by some. It is quite possible that an injury to the 5th nerve may cause sufficient changes in the nasal membrane to prevent its performing its usual functions.	At its origin, in the olfactory lobes, in the filaments, or in the olfactory membrane.
2nd. *Optic, Nerve of Sight.*—Gradual or complete loss of sight without appreciable changes in the retina or media.	Probable injury or disease at the origin or in the course of the optic nerves.
Hemiopia or half vision, one-half of the retina in one eye and the corresponding half in the other eye, not acting to the stimulus of light.	Some disease or injury to the nerve fibres in their course, before they enter or while they are passing through the optic commissure.
3rd. *Oculo Motor.*—Paralysis of upper eyelid (ptosis) from paralysis of levator palpebræ superioris; the eye which is turned outwards, is capable of partial movements only, *viz.*, such as can be produced by the rectus externus and obliquus superior; when the head is moved, the eye moves with it, the inferior oblique not being able to execute the usual rotation of the eyeball; the pupil is dilated, and the eye cannot accommodate for near distances. In squint or strabismus due to paralysis, the *secondary* deviation is greater than the *primary* one.[3] Often when the patient attempts to walk with his sound eye covered, he will suffer from vertigo.	Injury or disease at its origin or in its course. It enters the orbit through the sphenoidal fissure.

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[1] Vide Dr. Fenwick's Guide of Medical Diagnosis, 1876.

[2] Michael Foster's Text-book of Physiology, 1877. Nine pair of nerves according to Willis; twelve pair according to Sœmmering.

[3] The *secondary deviation* is the extent of movement the *sound* eye makes when excluded by the hand, whilst the squinting eye '*fixes*' itself on the object. The *primary deviation* is the movement which the *squinting* eye makes when the sound eye fixes upon the object. LAWSON.

Symptoms.	Seat of Lesion.
4th. Trochlear or pathetic. Motor nerve to obliquus superior.—In paralysis there is no marked difference in the position of the eye, but the patient sees double when he attempts to look straight forward or towards the paralysed side; the images, however, coalesce when he turns his head to the sound side. When the head is moved from side to side, the eye moves with it, the usual rotation of the eye which accompanies the movements of the head failing through the superior oblique not acting. In strabismus due to paralysis, the *secondary* deviation is greater than the *primary*.	Injury or disease at its origin or during its course; it enters the orbit through the sphenoidal fissure.
5th. Trigeminus (Trifacial).—A mixed afferent and efferent nerve with distinct motor and sensory roots, the latter bearing the ganglion of Gasser. *Efferent fibres.* Motor fibres to the muscles of mastication, temporal, masseter, two pterygoids, mylo-hyoid, anterior belly of digastric, and buccinator, the tensor palati, and tensor tympani; vaso-motor fibres to various parts of the head and face; secretory fibres to the lachrymal gland, and according to some authors to the parotid and sub-maxillary glands by fibres joining the facial. Trophic(?) fibres to eye, nose, and other parts of face; efferent fibres for the dilatation of the pupil. *Afferent fibres.*—General nerve of sensation of the skin of head and face, and of the mucous membrane of the mouth except the parts supplied by the vagus and glosso-pharyngeal. The back of the head is chiefly supplied by branches from the cranial nerves, and the external meatus and concha are supplied chiefly by the auricular branch of the vagus. Nerve of special sense of taste to the front part of the tongue.	Injury or disease at its origin or during its course. The Gasserian ganglion occupies a depression on the upper part of the petrous portion of the temporal bone, its ophthalmic branch leaves the skull by the sphenoidal fissure, the superior maxillary by the foramen rotandum, the inferior maxillary with its slender motor root leaves by the foramen ovale.
6th. Abducens.—Nerve to the external rectus, paralysis causes inward squint. It is joined by fibres from the cervical sympathetic and probably recurrent sensory fibres from the fifth. In strabismus due to paralysis the *secondary* deviation is greater than the *primary*.	Injury or disease at its origin or course. It enters the orbit through the sphenoidal fissure.

SYMPTOMS.	SEAT OF LESION.
7th. *Facial or portio dura.*—Motor nerve of the muscles of the face, nerve of expression. Disease of it causes paralysis of the orbicularis palpebrarum, and of the muscles of the face (Bell's); the face is drawn to the sound side, paralysed side is smooth, there may be paralysis of stylo-hyoid, digastric, buccinator, stapedius, muscles of the external ear, platysma, some muscles of the palate, levator palati and probably others.	It travels with the next nerve *(auditory)* to the internal meatus where it separates, it then passes through the aqueduct of Fallopius, close to the internal ear and leaves the skull by the stylo-mastoid forameh into the parotid gland.
8th. *Auditory or portio mollis of 7th.*—Special nerve of hearing, afferent nerve, impulses other than auditory proceeding from the semi-circular canals.	Disease at its origin or during its course, or in the internal ear.
9th. *Glosso—pharyngeal* (1st *part of* 8th *pair,*)—Paralysis of levator palati, azygos uvulæ, stylo-pharyngeus, constrictor faucium medius. Loss of taste on the back of the tongue. Loss of sensation on the back of the tongue, soft palate, and pharynx.	
10th. *Pneumogastric, Vagus, Par Vagum. Efferent fibres.* (2nd part of 8th)—Motor nerve for the muscles of the soft palate and pharynx, for the movements of the œsophagus, of the stomach, of the intestines, for the muscles of the larynx, possibly for the plain muscular fibres of the trachea and bronchial divisions. Inhibitory nerve of the heart.	Disease or injury. It leaves the skull with the pneumogastric and spinal accessory through the foramen lacerum posticus and then leaves them. It should be remembered that these three nerves enter the skull through the foramen magnum.
Afferent fibres.—Sensory nerve of the respiratory passages, and of the pharynx, œsophagus and stomach. Afferent nerve augmenting and inhibiting, of the respiratory centre, afferent inhibitory (depressor branch) and augmenting, (superior laryngeal) nerve of the medullary vasomotor centre, afferent nerve producing salivary secretion, inhibiting pancreatic secretion.	After its passage through the foramen it is joined by the accessory part of the spinal accessory nerve, several communications are at the same time established with the surrounding nerves.
Section of the vagi in the neck causes death by pneumonia; this has been regarded by some as an indication of "trophic" action.	
11th. *Spinal accessory,* (3rd *part of* 8th.)—Motor nerve to the sterno-mastoid and trapezius muscles. It receives recurrent sensory fibres from the cervical nerves. Part of the spinal accessory blends with the pneumogastric, and the efferent effects (such as the movements of the larynx, pharynx, &c., and cardiac	Fibres of this nerve are found coming from as low as the 6th

SYMPTOMS.	SEAT OF LESION.
inhibition) of the united trunk seem to be largely due to the spinal accessory fibres contained in them. It is stated however that division of the spinal accessory before it joins the pneumogastric, does not entirely do away with either swallowing or the movements of the larynx. In the movements of the œsophagus and stomach, brought about by the vagus acting as an efferent nerve, the accessory fibres seem to have no share. The cardiac inhibitory fibres seem to be distinctly of accessory origin.	or 7th cervical nerve in the spinal cord. The spinal portion of the nerves leaves the others after their exit from the foramen lacerum positicus.
12th. *Hypoglossal, or lingual motor* (*9th pair*).—Paralysis of the muscles of the tongue and of all those connected with the hyoid bone except the digastric, stylohyoid, mylo-hyoid, and middle constrictor of the pharynx. Paralysis of the sterno-thyroid. It is connected with the pneumogastric, lingual, three upper cervical nerves, and the sympathetic.	It takes its origin from the medulla oblongata and leaves the skull through the anterior condyloid foramen.
Complete paralysis of any cranial nerve, particularly of the whole 3rd. (Oculo-motor) 4th. (Trochlear or Pathetic) 5th. (Trigeminus) 6th. (Abducens). 7th (Facial and auditory), and complete anesthesia of one side of the face, or complete loss of any special sense.	Almost always central; generally on the *same* side of the brain. Probably *all* the cranial nerves decussate, as some most certainly do.
Partial anæsthesia (part of 5th nerve) and *partial* paralysis of other cranial nerves, as some forms of strabismus (squint), and ptosis (dropt eyelid), and partial loss of smell, &c., &c.	May sometimes depend upon pressure or interference with the functions of the nerves outside the cranium.
Hemiplegia.—Right arm and leg paralysed, and *left* half of face (mouth drawn to opposite side). In *left* Hemiplegia and *right* side of face, all the symptoms and seat of lesion should be reversed as to side.	*Left* optic thalamus, corpus striatum, or cerebral lobe of *left* side, or *left* half of pons Varolii, when *aphasia* is present with right hemiplegia the posterior portion of the third frontal convolution has been found affected. In many cases these symptoms and the seats of the lesion as given above do not coincide.
Hemiplegia.—Right arm and leg paralysed (as to motion) more sensitive and warmer, but *left* arm and leg cooler, and less sensitive or quite anæsthetic.	Injury to *right* half of spinal cord; above brachial plexus; below the decussation of the anterior pyramids.
Paraplegia.—Both legs paralysed, as to both motion and sensation, paralysis of the sphincters of the bladder and rectum.	Both halves of the spinal cord below the origin of the brachial plexus.

SYMPTOMS.	SEAT OF LESION.
Local paralysis of muscles as for instance of supinators and extensors of forearm and hand.	Must be looked for in the nerves supplying the muscle affected. In the instance quoted the musculo-spiral nerve has been found diseased or injured.
Locomotor Ataxia.—Diminution or total absence of power of co-ordinating movements, peculiar gait the feet being lifted up and thrown down in an irregular and extravagant manner, and brought down violently; turning round is difficult, the patient has to watch his legs to guide his motions, he cannot stand with his eyes shut, or in the dark, still less walk, there are severe stabbing or darting pains in the legs, pains or sense of constriction round the waist, double vision, impairment of sight, other cranial nerves are sometimes paralysed. The muscles of the affected limbs are well developed, respond to the stimulus of electricity, and there is no loss of reflex action when the patella-tendon is struck, *tendon-reflex.*	Atrophy and disintegration of the nerve fibres of the posterior columns of the spinal cord, with formation of amyloid corpuscles and hypertrophy of the connective tissue. The lesion is not always confined to the posterior columns, of the cord, Lockart Clark has described grey degeneration of the cerebral and spinal nerves, and various lesions of the grey substance.
Sclerosis of lateral columns of cord.—Gradual paralysis with rigidity of muscles and contraction of the limbs. No loss of sensation, sphincters not affected till late.	Excessive formation of connective tissue with wasting and disintegration of nerve fibres of lateral columns of cord, invading also anterior cornua of grey matter.
Disseminated sclerosis.—Gradual loss of power with tremor and agitation of muscles whenever they are called into action. Lips and tongue tremulous on speaking. Chin kept on the breast to avoid the effort of supporting the head which brings on tremor. Limbs quiet till moved, then agitated.	Patches of sclerosis found in different parts of brain and spinal cord.
Progressive Muscular Atrophy—Wasting Palsy.—Degeneration, loss of volume and power of voluntary muscles, without diminution of intelligence or sensibility; it may affect either the upper or lower limbs or the body, and it is usually symmetrical. Scapular muscles, deltoid, and those of the thenar eminence are often affected early. The muscles attacked waste away and almost entirely disappear; the general health is moderately good. The paralysis may become general and cause death from asphyxia, or apnœa; duration of disease, from a few months to many years.	Patches of granular degeneration found in those parts of grey substance of the spinal cord where nerves pass off to the affected muscles, also, amyloid corpuscles round central canal of cord, nerve cells shrunken and atrophied. It has been questioned whether the spinal cord lesion is primary or secondary.

There are many other forms of paralysis which must be diagnosed according to the system laid down in the early part of the chapter. Paraplegia may be due to disease of the spinal cord or membranes, as for instance spinal meningitis, myelitis, congestion, softening, hæmorrhage tumours, syphilitic disease ; chronic alcoholic, chloral, or stramonium poisoning, or it may be reflex, *i e.*, caused by excitation which has reached the cord from a sensitive nerve, in such cases there is probably an insufficient amount of blood in the cord. In all these cases an accurate, history and account of the mode of invasion of the disease will be required. There is a form of *infantile paralysis* the access of which is very rapid, generally occurs in strong healthy children about the second teething, it sets in with pyrexia, the pathological cause has not yet been settled. It is often fatal. Paralysis is sometimes *hysterical* in such cases there is no appreciable disease of the nervous centres or motor nerves. There is another form of paralysis called *rheumatic paraplegia,* sometimes the extensor muscles of the forearm, the deltoid and the trapezins are affected, it is said to be due to changes in the fibrous sheaths of the spinal nerves. *Pseudo-hypertropic paralysis* is a disease of early childhood, in which the legs and buttocks increase in size, the increase being due to hypertrophy of the connective tissue, the muscular tissue being atrophied. Death usually occurs about the age of eighteen from pulmonary disease. The pathological cause is unknown. Paralysis or palsy is sometimes due to poisoning as from mercury or lead, the mercurial poisoning giving rise to a peculiar form of *tremor,* and the lead poisoning acting principally on the nerves supplying the extensor muscles of the hand and fingers causing the peculiar *wrist drop.*

Paralysis agitans or *shaking* palsy is characterised by an involuntary tremulous agitation of the muscles which is independent of exertion, and goes on during the repose of muscles, commencing in the hands and arms or in the head, and gradually extending over the whole body. There is diminution of muscular power, the pathological cause is unknown.

CHAPTER X.

ON THE EXAMINATION OF THE INSANE.

The method of examination of a person suffering from mental disease differs materially from that of ordinary patients. He often cannot, and sometimes will not help you, indeed he may look on your examination in the light of an impertinence. The appearance of his tongue, the state of his pulse, the character of his secretions, may not help you in the least; you are obliged to rely upon the information gained from a close examination of the physiognomy, actions, conversation, powers of judgment and memory, you should always observe the state of the general health, in such patients even acute diseases are often masked. You will often find a want of vitality, and of nervous tone, deficient action of the skin and internal organs, and torpidity of the bowels, whilst attacks of giddiness, mental confusion, irritability of temper, inaptitude for usual work, odd conduct, morbid sensations and delusions often occur, you should carefully examine for signs of injuries both external and internal. In the investigation of the physiognomy your habits of observation on mankind in general will be called into full play. In order to appreciate the changes in the insane, you must have studied the varieties of expression which indicate the growth, normal state, and decline of mental vigour in the same race or class to which the patient before you belongs. You should be familiar with the cheerful open countenance of the man in the enjoyment of mental and bodily health and ease, with the vacant stare of the thoughtless, the melancholy visage of the disappointed, the dreamy look of the absent man, and with the wildness of the expression of the maniac; you will then be able to justly estimate the evidence written upon the forehead, the expressive language spoken in the eyes, and the inward restlessness betokened by the constant play of the muscles around the mouth.

Tanner say*, when investigating the actions, observe the attitude, gestures, movements, and general conduct. The facility, suppleness, and co-ordination of the movements must be noticed. The attitude of the old man with his head inclined on his chest, his back bent, and his knees giving way under him, is not more characteristic of a state of senility and exhaustion, than is the position of an unfortunate human being seated on the floor, with his chin resting on his knees, motionless for hours, and entirely unmindful of all that is passing around, indicative of incurable dementia. The gestures alone often indicate the passion which predominates. In insanity from disappointed love, airs of langour are often affected; in that from religion, great humility and attention, in that from sexual excesses, a downcast appearance, an evident desire to avoid notice, and an inability to look one in the face.

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* Tanner's Clinical Medicine by Dr. Tilbury Fox.

To engage in conversation with an insane person, you must try and gain, by a sympathizing and kind manner, the confidence of the patient. He may be mad on many, or only on one subject, you should if possible, ascertain from his friends beforehand what the delusions are and gradually lead up to than in order to satisfy yourself.

In such cases, your own knowledge of the world, of the social and religious manners and customs of the race to which the patient belongs, will be fully tested.

The memory of the insane may easily be tested if his confidence has been gained, by a few quiet questions as to his name, age, address, the number of his family, the nature of his occupation, the day of the week; where there is evidently mental weakness, you may ask the patient to shut his left eye, give his left hand, put out his tongue, show his right leg, and so on. An examination of the letters written by such a patient will often give you information upon his mental state, while they at the same time may teach you his intimate thoughts, such letters are often rambling and incoherent, and a very frequent characteristic of them is that they are full of wants.

In drawing up a statement respecting a person presumed to be insane, Dr. Bucknill recommends that the matters to be noted should be classed under the following heads: *appearance, conduct, conversation.*

Appearance may be meaningless, vacant, melancholy, depressed, frightened, or fierce.

Demeanour and *conduct* may be childish and silly, or moping and inert, or destructive, or aggressive, or distinctive of peculiar states of emotion as of vanity, pride, or fear.

The speech may either indicate a negation of mental faculty by its absence, or intense pre-occupation as in some forms of melancholy, or by its positive evidence may be a testimony to all phases of incoherence or delusion.

In the legal certificates required in this country before a patient can be admitted into a lunatic asylum, the following observations have to be filled in. (*Vide* Lunacy Act No. XXXVI of 1858).

In Form A. Firstly, the facts indicating insanity observed by yourself; secondly, other facts, indicating insanity communicated to you by others.

Form C. is the Madras Government form for recording the case.

In Forms B. & C. you must enter the disease, name with Christian name at length, age, sex, by whom sent to the asylum, the date of admission, the temperament, whether married, single, or widowed, the number of children, the condition of life and previous occupation, where born, and previous place of abode, religion, whether first attack and the duration of the present attack, cause whether moral or physical, whether hereditary or otherwise, habits and disposition, the degree of education, whether natural affection is perverted or not. The evidences of insanity, whether dangerous to self or to others, details of previous treatment, the state of the bodily health, whether there are any injuries from violence, the age if known on first attack, when and where the patient has been previously under care and treatment, whether he is subject to epilepsy, whether suicidal. Whether the patient has been found lunatic by inquisition or inquiry, under orders of a court and the date of the commission or order for inquisition or enquiry. Whether any member of the patient's family has been, or is affected with insanity.

The following is the classification of disorders of the intellect given in the Nomenclature of diseases:

Mania, is defined as a disorder of the intellect with excitement, divided into acute and chronic;

Melancholia is defined as a disorder of the intellect, with depression, often with suicidal tendency. It is stated that cases of so-called monomania are to be classed under chronic mania or melancholia, according to their character.

Dementia, is defined as a disorder of the intellect characterised by loss or feebleness of the mental faculties, it is divided into acute and chronic.

Paralysis of the insane or general paralysis 'is a combination of insanity with a gradual increasing loss of motor power.' (Tanner.)

Idiotcy and *Imbecility* are both considered congenital.

Hypochondriasis is defined as some disturbance of bodily health, attended with exaggerated ideas or depressed feelings, but without actual disorder of the intellect.

The Surgeon General H. M. F., Madras, in his departmental circular No. 3 of 1882, states that he believes he is right in saying that the law recognizes mental alienation as (1) in insanity; (2), in idiocy; (3), in unsoundness of mind; the first pretty nearly corresponding to the "Mania" of the statistical nomenclature, and the second to congenital idiocy. The third has no complete equivalent in the Nomenclature, but the following is a legal definition: "a person not idiotic, not lunatic, but one who by reason of a morbid condition of intellect is unable to manage himself or his affairs."

CHAPTER XI.

HINTS ON CLINICAL OBSERVATION ON DISEASES OF WOMEN IN THE LYING-IN-ROOM.

Position and size of the uterus and Appendages.

The healthy unimpregnated *uterus*, is suspended midway in the 'pelvic cavity.' The 'fundus' lies slightly below the plane of the pelvic brim and a line drawn from the upper border of the symphysis pubis to the lumbosacral articulation would indicate about the upper limit of the organ. A line drawn from the lower border of the symphysis pubis to the junction between the 4th and 5th sacral vertebræ would pass through the lower part of the cervix. In its general direction, the uterus lies with its long axis in the axis of the brim of the pelvis. It is held in position chiefly by its relations to contiguous viscera, particularly the bladder and rectum, by the support afforded by the surrounding connective tissue and by the vaginal column, by folds of peritoneum around (the so-called ligaments) and by the two round ligaments which are continuations of the uterine muscular tissue. The peritoneum is in close contact with it at the upper part, covers the anterior surface of the body and the whole of the posterior surface except the infravaginal cervix. The organ is capable of a considerable degree of movement, and its position varies with the state of the adjacent viscera, the posture of the individual and with certain acts such as defœcation straining, coughing, &c. The upper part or fundus is more moveable than the cervix. The cavity of the healthy unimpregnated uterus measures 2½ inches of which about half belongs to the cervix. The cavity of the body is more or less triangular and flattened from before to behind. The cavity of the cervix is spindle-shaped, extending from the os uteri externum to the os uteri internum. The greatest breadth is at the fundus, the greatest thickness 11 or 12 lines. The average weight 9 or 10 drachms. From each angle of the fundus spring the *Fallopian tubes* which are contained in the central portion of the lateral folds of peritoneum called the broad ligaments. The '*ovaries*' lie in the posterior fold of the broad ligament on either side of the uterus and separated from it by a short space. They can be rarely felt unless displaced or enlarged. The inferior portion of the cervix is implanted into and projects into the vagina for about 4 lines. The *vagina* is a curved canal from 3 to 4 inches in length with its sides in apposition to one another. Posteriorly its upper fourth is in direct relation with the peritoneum.

METHODS OF EXAMINATION AND MEANS OF DIAGNOSIS IN CASES OF UTERINE DISEASE.

Abdominal palpation, simple abdominal palpation, the patient lying in the dorsal posture, affords much information especially in cases of inflammation, tumors, &c.

Inspection is required occasionally, but is by no means invariably necessary or desirable.

Simple vaginal touch is practised with the patient lying in the dorsal posture or on her left side.

Bi-manual examination or conjoined manipulation.—This is of all the most useful form of examination and affords more information than any other method. It combines simple vaginal touch with palpation. It is best practised with the patient lying on her back on a flat couch with a light covering over her, everything tight in the shape of stays being removed or loosened. The left thigh should be slightly flexed on the abdomen. The index or index and middle finger of the left hand should be lubricated with oil or simple ointment and passed under the left thigh to the vaginal outlet, at the same time the right hand can be placed flat on the abdomen without. The examining finger can then examine, if required, the external generative organs and can then be passed into the vagina. Here it will note the existence of pain, spasm, &c., the capacity, existence of tenderness and temperature of the vagina, the condition of the walls, relaxed or otherwise, the presence of any discharge and its character. From the examination of the vagina, the finger can be passed on to the cervix uteri. Here note—position of cervix in the pelvis, size, general direction, the existence of tenderness, consistency of tissue, size and shape of external orifice, existence of any roughness or erosion, presence of discharge and its character. With the assistance of the external hand the position and size of the whole organ, its consistency, the presence of tenderness, its mobility, &c., can be accurately guaged in almost all cases by a careful manipulation. From a general examination of the uterus, the examining finger can leave the cervix and be passed in succession, behind, on each side and in front, and any thickening around the organ, the presence of any tumor and its relation to the uterus can be made out, the condition of the ovaries can also be investigated.

Rectal touch.—This is best practised with the patient in the left lateral position. It is a useful method of examination in virgins when a pelvic examination is necessary or for the better investigation of the ovaries.

Speculum.—This instrument is useful rather as a means of treatment and should not be depended on to too great an extent as a means of diagnosis. In using the speculum, the patient should lie on the left side with the hips at the edge of the bed and the thighs bent on the abdomen the right being thrown over the left. The most useful speculum for either diagnosis or treatment is Sim's univalve speculum or perineal retractor. Furguson's tubular speculum is useful for exposing the cervix and Cusco's bivalve speculum is useful for all purposes. In using the speculum note. Pain or spasm on introduction, appearance of vaginal mucous membrane and of any discharge, appearance of cervix and external os uteri with presence and character of any discharge.

Sound.—The sound or uterine probe is generally used as a means of diagnosis to determine the position and size of the uterus. The most useful sound is made of flexible metal and marked by notches at the inches for about 8 inches.

The flexibility of the instrument allows it being bent into any shape. It is best used in conjunction with the speculum. The cervix being exposed it may be fixed by a fine vulsellum forceps or tenaculum. The sound being then held lightly in the right hand, the tip being oiled, can be passed into the cervix and on if necessary, to the fundus. With this instrument we ascertain the shape of the uterus, the position of the organ, the shape and capacity of the cavity, existence of tenderness, &c. By graduated metallic sounds, we can also ascertain the size of the external orifice and the dimensions of the cervical canal. Caution must invariably be exercised in the use of the uterine sound.

Dilatation of cervix uteri by tents.—This is occasionally necessary when it is required to investigate carefully the cavity of the uterus, either as a means of diagnosis or a method of treatment.

POINTS TO BE NOTED IN RECORDING CASES OF SPECIAL DISEASES OF WOMEN.—(MODIFIED FROM THOMAS).

Date, name, age, married? number of children, number of miscarriages, date of last confinement, date of last miscarriage, age at first menstruation, date of last menstruation, how long ill, supposed cause, symptoms, present condition and general health.

Menstruation, regularity, duration, amount, pain.

Leucorrhœa, character, amount.

Pain, locality, character, *other symptoms.*

Physical examination.

1, Vaginal touch; 2, speculum; 3, sound.

Diagnosis.

Treatment.

Points to be especially attended to in cases of Lying-in-women.

Attend at once to any summons to a woman in labour.

Take Stethoscope, ligature thread, blunt pointed scissors, male elastic catheter, No. 8 or 9, Higginson's syringe, blunt pointed bistoury, double curved long forceps, suture needle with wire or silk, chloroform, laudanum, ergot; ammonia, neutral solution of perchloride of Iron, minim measure.

Conduct in Lying-in-room to be calm, cheerful and reassuring.

Determine if woman is really in labour or suffering from false pains.

Enquire into general health, nature of previous labours if any, state of bowels and bladder.

Examine abdomen for fœtal heart and movements.

Vaginal examination note—degree of warmth and moisture, size and distensibility, condition of rectum, capacity and form of pelvis, state of cervix, thick or thin, soft or rigid, degree of dilatation, presence or absence of membranes, presentation and position of child, character of pains.

In first stage avoid frequent examination and allow woman to sit or move about. In second stage examine more frequently and note progress of labour; keep woman lying down in any position until head is on perineum when the left lateral should be assumed; at birth of child, follow uterus down, and, after separating child, place mother on back and support the uterus.

Conduct third or placental stage with great care.

Half an hour after placenta is cast, apply binder if uterus is firm; if Hæmorrhage has occurred, uterus should be manually supported for two hours. Do not leave the house till one hour after placenta has been cast.

In the Puerperal State.

Visit woman within twelve hours after delivery.

Enquire into sleep, passage of urine, condition of external genitals, discharge, after pains, food.

General appearance, pulse, breathing, condition of uterus and bladder, binder.

During puerperal state.—Note—character of lochia, occurrence of fever, want of sleep, quick pulse, distension of abdomen, tenderness of abdomen or uterus, distension of breasts.

Keep a native recumbent for a week and a European for ten days or a fortnight. Exertion to be made only gradually and with caution.

With regard to the Infant.

Note at birth, formation, navel.

After-birth, sleep, navel, excretions, clothing, food.

Points to be observed in recording cases of labour.

Name, age, number of pregnancy, nature of labour (natural, difficult, preter-natural, or complex.)

Presentation.

Position.	1st stage.
Sex of child.	2nd stage.
Duration of labour.	3rd stage.

CHAPTER XII.

ON THE EXAMINATION OF CHILDREN.

This subject requires some remarks, in the first place the mortality amongst children is very high, their diseases often run a very rapid course especially in this country, and lastly, it is only by the exercise of close observation, great patience, kindness, gentleness, and a peculiar tact, that a man ever becomes a good child's doctor. First, learn from the mother or guardian its hereditary tendency, its previous illnesses, and the history of the present illness.

Sir William Jenner's directions to his class* in reference to the mode of examining children, are somewhat as follows. After stating that the diseases of children are not as ill-defined as some persons imagine, he proceeds to say, that if called to a child and it be asleep, the practitioner should not wake it, but whilst it is asleep, he should note its attitude and position, whether it lies covered or uncovered, if with its legs drawn up or not, if it lies on its back or its side, the two latter points indicating the degree of strength and the seat of pain. The colour of the cheeks (heightened in pneumonia and typhoid) should be noticed, or local sweating especially about the head, as is seen in rickets. The expression of the face, which is calm in health should be noted, moans, startings, twitchings, shrieks, clutching of the hands, are to be observed as they are suggestive of cerebral mischief, twitching of the mouth often occurs in gastric irritation. The observer should then note if the nares act markedly, as in acute chest affections, whether the eye be completely closed as in health, or half closed as in cerebral disease, if the respirations be quickened or not (they are from 30 to 40 in a minute in health.)

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* Tanner's Clinical Medicine, by Dr. Tilbury Fox, 1876.

If the child is awake on your entrance, take care that the sight of a stranger does not frighten it. Do not let it see that you are observing it for some time until it has got accustomed to your presence, the first thing you have to do is to gain its confidence which you must retain all through, or you will never be able successfully to examine or treat it. No one ever gains the confidence of children who does not love them. If the child is awake the pulse is readily excited, it should therefore be felt in sleep, the hand being warmed for the purpose. The pulse of a healthy child under two years may beat from 90 to 140 in a minute, or more, after three years it does not exceed 100. A very rapid pulse is little guide to disease in children, a slow pulse is of more consequence. The state of the fontanelles should be noticed especially in reference to their size, tension, and pulsation, when the child is awake. When a child wakes, its expression, the state of the surface, and position may be observed, a smile is inconsistent with serious illness. In abdominal affections, the mouth is pinched up, the legs drawn up; the expression is one of suffering in colic, of langour in enteric fever, there is a wasted look in chronic diarrhœa, a "shrivelled" face in muco-enteritis, an aged appearance an earthy hue of the skin with fissured corners of the mouth and condylomata in congenital syphilis. The hand should always be passed over the head, which is enlarged in hydrocephalus, rickets, and hypertrophy of the brain, and the fontanelles much opened. Then the child should be stripped if necessary, when rickety deformities can be seen, enlarged glands and eruptions be detected, the arms and feet examined for syphilitic eruptions, and the buttocks for itch. The shape of the chest is peculiar in young children, there is a constriction at the upper border of the liver on the right side, and the upper border of the stomach on the left side. In some diseases, of the pleura, in rickets and when there is spine disease the chest is often altered in shape. The apex of the heart beats rather more to the left than in the adult, marked signs of lung disease are found at the back, and friction sounds between the scapulæ are due to disease of the bronchial glands. The belly is big in children, this is accounted for by the short pelvis, the large liver, the thin and unresisting abdominal walls, and the fact that the diaphragm is less arched than in the adult. The spleen kidneys and liver are easily felt. The child should now be made to put its arm around the mother's neck, if it be frightened it clings all the closer, and renders the back tense, which can be auscultated either *mediately* or *immediately* and then percussed. The chest is not very resonant since the walls are flaccid and do not vibrate. A supposed big head is often a trouble to mothers, if the fontanelles are closed and the child be about two years of age, or they be just open and no cerebral symptoms be present, there is no need for anxiety. In practising percussion, care must be taken not to strike too smartly, the variations in resonance being more readily appreciated by a gentle stroke, it is almost unnecessary to say that mediate percussion must be employed, that is to say the blow must fall on the finger not on the chest wall. Valuable information may often be gained by listening to the chest of a child when it is crying, since the forced inspiratory and expiratory movements cause the air to enter and leave the lungs rapidly, and to expand them more fully so as to bring out various ronchi and other sounds which might otherwise not be produced if the breathing was tranquil. The child's cry is in this case equivalent in its action to the taking of a "deep breath" in an adult. The respiration is slightly puerile in a child. Lastly, the temperature, then the state of the tongue, the condition of the gums, of the tonsils, and of the number of the teeth, remain to be ascertained, it being generally better to examine these last as they are usually the most grievous part of the examination to the child.

Children cut their teeth as follows :—At seven months, the two lower incisors, and complete the others at ten months. At one year old, the first molars appear; at one and a half year, the cannies; at two, the last molars; and at six and a half, the first permanent molars. There are no bicuspids in children. Healthy children grow at the following rate per annum. Slow growing, two inches; average, two and a half; fast, three. A child that grows only two inches a year will be a short adult. Weight should increase regularly with height, and growth should be regular not by fits and starts. A child thirty-six inches high should weigh thirty-six pounds, at forty-eight inches should weigh sixty-eight pounds, at sixty inches ninety pounds. The fontanelles should be closed at the end of the second year. Attention should be especially directed to the state of the nursery, the surroundings of the child, its food and clothing. Dr. West says, minute rules for your examination of children from three years old and upwards are not needed, but patience the most untiring, and good temper the most unruffled, are indispensible.

CHAPTER XIII.

HINTS ON TAKING SURGICAL CASES.

Record first the name, age, caste or race, occupation, residence, date of admission, and name of disease or injury.

Commence your case by describing the state of the general health of the patient, his aspect, temperament, habits, and in cases in which there is any marked diathesis, cachexia, or hereditary disposition to disease, note them. Describe the nature of the injury or disease, giving its assigned cause or method of production, give the order of succession of the symptoms. Note the former treatment and its results, and the date of any marked change in either symptoms or treatment.

Note, when irregular, the condition of the different physiological systems as laid down in the hints on case taking at pages 60 to 65; always examine the urine for the presence of albumen or tube casts in cases for operation, or in cases of chronic diseases of the urethra or bladder.

Note whether the patient has suffered from previous diseases or injuries, if so, their dates and treatment.

Record in full the treatment as to appliances, medicines, operative interference, and diet. In watching the progress of the case, carefully note any change in the old or the appearance of any new symptoms, watch daily the temperature, the rate of the pulse, and respirations, in cases attended with fever. Note the date of any change in the treatment, or diet, giving the reasons, carefully fill in the result as to present state, and probable future recovery, and the date of discharge from hospital. If the case is fatal, give the *post-mortem* appearances as reported in the hospital record.

The value of these 'cases' depends upon their conciseness, and accuracy. In the rough case book laid weekly before the clinical teacher, a note should be entered in chronic cases at least once a week recording the exact state of the patient, and any changes he may have gone through in the interval.

The following hints will give the student some idea of what questions he should ask in different diseases and injuries.

Surgical fever.—Note always the time at which the fever sets in, and the course it runs, make morning and evening observations on the state of the pulse, respiration, and temperature. Find out from the previous history of the patient whether he was exposed to malarious influences, and if he has suffered from such fevers, to what extent, and when he had the last attack. (In patients who have been exposed to such influences we often see a marked periodic character in an attack of pyrexia from any cause.) When inflammatory secondary fever sets in after the first attack has passed away, it generally depends upon some inflammation being again set up, in or about the wound, or upon suppuration setting in. Note the amount of weakness, emaciation, the character of the discharge from the wound at first attack, and the state of the wound or injury from day to day.

Septicæmia or *Septic fever.*—Note the state of the wound and the character of the discharge from it, take the rate of the pulse, respiration, and the temperature morning and evening, note the changes in the constitutional symptoms daily as to the progress of emaciation, the state of the tongue and digestive tract, the skin, the urine should be daily examined for the presence of albumen, watch for the formation of bed sores. Note the state of the nervous system especially as to apathy, note the mode of death in fatal cases.

Pyæmia.—Watch carefully as in cases of Septicæmia and Surgical fever, look out for intermittent occurrence of accessions of fever, and record the temperature, rate of pulse, and respirations, when the paroxysm is at its height in addition to the ordinary morning and evening observations, watch for the formation of metastatic abscesses, and diffused metastatic inflammations especially of the joints, watch for *rigors*, note their duration and intensity, watch for signs of inflammation of the internal organs as the heart, lungs, liver, spleen, kidneys, observe the colour of the skin and its state, note the expression of the face, watch for gradual emaciation, nervous depression, and for signs of thrombosis or embolism in any of the large vessels. Note the mode of death in fatal cases.

Hectic or Suppurative Fever.—Note the cause, it may follow the formation of large abscesses, or appear in cases where there is prolonged suppuration, or where there is rapidly advancing ulceration, note the character of the fever, whether continued or remittent, (the temperature curves are often very steep, low in the morning and high in the evening). Watch the progress of the emaciation, night sweats, diarrhœa, note the character of the stools, watch for visceral complications of the lungs, liver, spleen, kidneys, from time to time examine the urine especially for albumen and renal casts. Watch for signs of general dropsy, death generally takes place from exhaustion.

It should be remembered that an attack of fever in Surgical cases is *symptomatic* unless it is simply due to a paroxysm of malarial fever.

Inflammation and Suppuration.—Find out the cause whether *idiopathic*, or *traumatic*, note the tissue affected, and the extent, whether it is circumscribed or diffused, the degree of redness, pain, heat, and swelling,—the amount, if any of constitutional disturbance as shown by the state of the digestive system, the rate of the pulse, respiration, and the degree of pyrexia. Watch daily for any signs of extension or subsidence. When it is extending, or not subsiding, examine locally for signs of deep seated œdema, or softening, particularly in the centre of the tumor, or for the sense of fluctuation, watch the range of the temperature for any signs of change in the character of the pyrexia, note the occurrence of any sweating, shivering, or rigors. If suppuration occurs, note whether it is circumscribed or diffused, how the abscess was evacuated, the amount and character of the contents,—how it was drained, whether it is connected with disease of any of the deeper seated structures. Note the treatment and its results.

Intestinal Obstruction.—Note the state of the patient on admission, the date of the last natural motion, examine for signs of peritonitis, or strangulated hernia, find out if the onset of the symptoms was sudden or otherwise, inquire as to their intensity, and rapidity, and as to the seat of pain, examine by inspection and palpation to see if there is any tumour. Inquire as to the state of the bowels whether there were any dysenteric symptoms, and what was the character of the motions, if any, if there has been any hæmorrhage, whether there has been vomiting and if so was it stercoraceous, note the treatment and its effects.

Hernia.—Record its variety and character, its size and position, its period of existence, assigned cause and form, whether previously irreducible, and if a truss had been worn.

When strangulated, give the symptoms, general and local, dating from the exact period of strangulation, record the first appearance of sickness, and the character of the vomit.

Previous and present Treatment.—If by taxis, state whether forcible and how long applied, whether with or without chloroform, when by operation, if sac was opened or not, if opened, why ? note its contents and their appearances. On reduction, note the time always from the first symptoms of strangulation, record the success of the treatment—both immediate and final.

Wounds.—Note the variety, whether incised, punctured, lacerated or contused position, extent and depth, how and with what produced, if poisoned nature of poison when on scalp, note if exposing bone. Complications, hæmorrhage, presence of foreign bodies. Treatment amount of secondary inflammation and result, whether united by adhesion or granulation. In all cases sent by the Police, the original notes should be carefully kept.

Gunshot wounds.—How produced, the nature and velocity of the projectile, the extent of the wound, the organs, bones or vessels implicated, the position size and appearance of the wounds of entrance and exit if present, what was the probable position of the patient when he received the injury. The time of the receipt of the injury, the state of wound when seen, the character of discharge if any, the amount of primary shock, and its duration, the amount of reaction, the present state of the patient, the amount of primary hæmorrhage and its treatment. How the examination of the wound was performed whether by finger, or by any particular probe. If any foreign bodies have been extracted as bullets either whole or in parts, fragments of shell, bone, portions of the clothes, &c., &c., always examine the holes in the clothes to see if any portions are missing. Note the amount of surgical fever, the progress of the case, its complications, treatment, and the result as to state on dismissal from hospital, and as to permanent injury.

Burns and Scalds.—Note their cause, their position, the extent of surface implicated, the degree in different parts, the amount of primary shock and reaction, the present symptoms, the progress, complications, particularly affections of the lungs, or hæmorrhage from the bowels, treatment, and result as to scars or permanent contractions or disfigurements.

Tetanus.—Cause; if an injury describe it, when did it occur, what interval was there between the injury and the beginning of the tetanus. If there are spasms describe them. Report the condition of the bowels, pulse, respiration, and temperature both morning and evening, and the amount of sleep the patient has had. In fatal cases note the immediate cause of death.

Fractures.—Whether simple, compound, complicated, or greenstick, how and when produced, position and direction of the line of fracture, amount of injury to vessels and soft parts ; in compound fractures, note the position and extent of the external wound, if produced by the primary force or by the broken bone, what vessels, nerves or joints are involved, record the constitutional symptoms. Note the amount of primary shortening if any. Note all the primary symptoms and their changes also the amount and duration of the shock.

In fractures of the pelvis, or upper parts of the femur, always examine the state of the bladder.

Note any change in the local or general treatment. Note the exact measurements on discharge and amount of deformity, if any.

Dislocations.—Form and position of joint, whether simple or compound, how and when produced, measurements, previous treatment.

General appearance and position of the limb, mobility, pain, amount of injury to soft parts, time after injury, treatment, whether by manipulation or extension, mode of application of extension, its direction, duration, and additional means, whether under chloroform. Result, immediate and final.

Nélaton's line, for judging the relations of the great trochanter in injuries of the hip is given as follows by Holden* 'If in the normal state, you examine the relations of the great trochanter to the other bony prominences of the pelvis, you will find that the top of the trochanter corresponds to a line drawn from the anterior superior spine of the ilium to the most prominent part of the tuberosity of the ischium. This line also runs through the centre of the acetabulum. The extent of the displacement in dislocation or fracture is marked by the projection of the trochanter behind and above this line.'

Holden recommends that the thumbs be placed firmly on the iliac, spines while the fingers grasp the trochanters on each side. Having the sound side as a standard of comparison the hand will easily detect any displacement on the injured side.

Bigelow points out the importance of remembering in dislocations of the hip, that the head of the femur falls nearly in the direction of the inner aspect of the inner condyle.

Bryant's test line.†—The patient lying on the uninjured side, draw a line from one anterior superior spine till it gets round to the opposite anterior superior spine, and a second from the anterior superior spine to the tip of the trochanter major (similar to the anterior half of Nélaton's line). The "test line" is one at right angles to the first down to the tip of the trochanter major, these three lines form a triangle which should be measured on both limbs. Any difference in the length of the "test line" on the injured side as compared with the sound side, shows with precision the amount of change in the position of the neck of the thigh bone. In comparing the two sides of the body see that the pelvis is straight.

When measuring the extremities for recording the shortening in fractures or dislocations, or after the union of fractures, always note the points you have measured from, and also the length between the same points in the uninjured limb.

In the upper extremity as a rule measure from the acromion process of the scapula to the internal condyle of the humerus, and from it to the styloid process of the radius.

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* Landmarks Medical and Surgical, 1881.

† The Practice of Surgery, 1876.

In the lower extremity measure from the anterior superior spine of the ilium to the top of the patella, or to the internal condyle of the femur, or directly to the internal malleolus.

Fractured Skull.—Note the position and kind of injury, the direction and amount of force, if attended by hæmorrhage, its amount, and whether from nose, mouth, ear, or external wound. Give evidence—if any—of brain mischief, or watch carefully for symptoms of such mischief if they are not present.

In suspected Fractured Base.—Note if there is paralysis of the facial nerve, whether there is any flow of blood or serum from the ear with the time of its first appearance after the injury, its duration and amount, observe the condition of the sense of hearing, of vision, and atate of the pupils, presence or subsequent appearance of sub-conjunctival hæmorrhage. Amount and duration of shock, reaction, relapses. If complicated with internal injury of the brain, as concussion, or compression. Carefully record symptoms in their order of succession, and whether they immediately followed the injury or not, the duration and amount of unconsciousness, insensibility, paralysis, its position, and kind, whether of motion, sensation, or both, condition of sphincters, character and rate of the pulse, respiration, condition of skin as to moisture and temperature, always examine the urine for albumen. Note the treatment, and subsequent progress of the case.

Concussion of the Brain.—Cause, amount and duration of shock, primary symptoms, general state as to consciousness, state of pulse, respiration and temperature, symptoms of brain injury, treatment, secondary symptoms, result.

Concussion of the spinal cord and fractures of spine.—Note the cause, seat of injury, symptoms as regards paralysis its extent and kind, other signs of nerve injury, state of bladder and rectum, presence or otherwise of local tenderness along the spine, its seat, if any crepitus present, complications or other injuries, progress of case, appearance of bed sores, treatment, result especially as regards future usefulness.

Diseased Bone.—Part affected, duration, cause, as external injury, syphilis, mercury, extent of bone implicated, superficial or deep, partial or general, previous treatment, especially as regards operations. Condition of dead bone or sequestrum, whether fixed or loose, number and position of openings, with the date of their first appearance. Note the treatment and its result.

Diseases of Joints.—Joint affected, date of first discovery, assigned cause. Note the early symptoms in the order of their appearance, and date of any fresh symptom or marked change, if pain or uneasiness preceded swelling or was coeval with it, if the former, how long before? Note the position of joint, if flexed, the angle of flexure, its size and shape. Rapidity of progress, previous treatment and its effects. Character of swelling uniform or bulging, on palpation, whether hard, soft, elastic or fluctuating, amount, of mobility, if attended with grating, in the knee joint note if the patella be free or not, if free, the sensation felt on moving it, condition of skin, if fistulous openings exist, their position, number, and the character of their discharge, whether deep or superficial, note the date of their first appearance, and if natural or artificial. Pain whether acute or gnawing, its position, if aggravated by motion or inter-articular pressure, if increased at night, whether sleep is disturbed by starting of the limb, whether there is sympathetic pain and its position, note the condition of the muscles of the limb, and the constitutional symptoms. Treatment.

Enlargement of the Testicles.—Note the condition of the tumour as to tenderness, elasticity, solidity, induration, translucency, fluctuation, present shape and size, position of the testicle, presence of the testicular sensation, rate and progress of growth, whether painful at any time, fix the exact seat of its commencement, note the cause as injury, or strain; syphilitic, tubercular, cancerous &c., condition of cord, condition of inguinal or abdominal glands, result of exploratory tapping if performed, are both organs affected, complications, general state of health, treatment, progress, result.

Hœmaturia.—Alleged cause, present constitutional state, if any strain or injury, pain or tenderness in lumbar, hypogastric regions, in perineum, urethra, or penis, pain in testicle or retraction of the testicle, if blood passed in clots or otherwise, if clots, are they passed out like casts of the urethra, when floated out do they spread into large masses with fimbriated margins, is the blood passed before, with, or after the urine—state the result of the examination of the genito-urinary tract, and of the microscopic examination of the urine.

Stricture.—Whether spasmodic, organic, traumatic, inflammatory or mixed, its duration and assigned cause, especially as regards gonorrhœa, use of injections, or accident, if previously treated by catheter, complications as acute cystitis, abscess, fistula, with their position and date of appearance. Note the character of the pyrexia if the patient suffered from the so-called *urethral fever* after the passage of an instrument. Always make a systematic examination of the urine, and if there be albumen from any cause examine with the microscope for renal tube casts.

Retention.—Mention period of retention, preceding symptoms, and cause, as stricture, calculus, paralysis, abscess, prostatic disease, exposure to cold, drink; note the constitutional and local symptoms, previous and present treatment, if by puncture, note the date of removal of the canula and of the arrest of the flow of the urine through the wound.

Extravasation.—Cause, over-distension or accident, duration of retention before urethra gave way, and period that elapsed before being seen. Describe the appearances and extent of parts infiltrated, constitutional symptoms and treatment.

Venereal Disease.—Chancre whether hard or soft or a simple ulcer, position whether glandular, urethral, coronal or frœnal, external, internal, or fringing preputial. Date of appearance after exposure, and its primary character. Present character—indurated, non-indurated, aphthous, raised, excavated, irritable, phagedænic, or sloughing. Condition of inguinal glands—indurated or inflamed. Previous treatment, particularly as regards mercury.

Constitutional Syphilis.—Note the date of the appearance, and the character of the primary sore, the first appearance of the *Secondary* symptoms and how they were ushered in, the course they ran, and any subsequent appearance of new lesions, the present state, particularly as regards the general health, the present appearance of the *Secondary* lesions, and any changes in the tissues the result of the disease. Note the treatment, both previous and present, progress and result. Remember this disease may be hereditary.

Gonorrhœa.—The symptoms it set in with, date of contraction, former treatment, especially as regards injections presence of balanitis, phymosis or paraphymosis, complications, and their duration, if there is epididymitis whether it followed suppressed discharges, use of injections, copaiba, or violent exercise.

Stone in Bladder.—When discovered, where acquired, date of earliest symptoms, if preceded by the passage of sand, amount of irritability of bladder, character of urine, constitutional and local symptoms. Treatment, whether by lithotrity or lithotomy, in former note how often performed, in latter note any peculiarity and the date of arrest of the flow of urine through the wound.

Tumours.—Date of appearance and size, present size, rapidity of growth, single or multiple, general and local symptoms, their order of appearance. General health, prior to discovery and since, implication of glands or the existence of secondary growths, hereditary tendency, assigned cause. In mammary tumours, number of children, date of birth of last, if ever suckled with affected breast, condition of the catamenia, if ceased, how long? Previous treatment and result.

Note the position of the tumour, its size, shape, external aspect and condition of skin, pain and its character, condition of lymphatic glands, manipular indications,—mobility; when in breast, whether moved by traction of the nipple? Feel—whether hard, soft, elastic, or fluctuating; constitutional symptoms. In recurrent growths, give the date of former operations, date when healed, and of its first re-appearance and position.

Elephantoid tumours.—Note the place of abode, whether the disease is common in the neighbourhood where acquired, whether at commencement of growth or during its progress there has been "elephantoid fever," record the size, position, and state of the new growth, are other parts of the body effected.

Lymph Scrotum.—Note the place of abode when the disease was acquired, whether the patient ever suffered from chyluria, examine microscopically the blood and lymph for the *filaria sanguinis hominis,* (see chapter on the use of the microscope); give the size, appearance and shape of the new growth.

Mycetoma or Madura foot.—Note the place of abode when the disease was acquired, exact mode of commencement, progress and present amount of implication of the tissues, whether the glands are affected or not, note the colour of the *particles* discharged and their microscopic appearances, see chapter on the use of the microscope.

Guinea Worm, Filaria Medinensis.—Note the place of abode when the disease was acquired, how it was acquired if known, the portion of the body in which it first appeared, the number, whether any were broken in attempts at extraction, whether there was any subsequent inflammation and how it first showed itself, examine the fluid of the bullæ for young filariæ under the microscope.

Ulcers.—Cause, position, shape, size, number, appearance, constitutional state, treatment.

Operations.—Describe the position, direction, and number of external incisions, the steps of the operation as performed, its duration, the number of vessels tied or twisted, and the amount of hæmorrhage. In amputations, the part amputated, and the position and mode of amputation. In flap operations give the position of the flaps, whether anterior, posterior, or lateral, note whether performed by perforation or external incision and how much muscle was left with the flap if any. In the combined flap and circular operation, note the position of the skin flaps, in all, note the result and the character of the stump. Note the mode of dressing, the amount and progress of reaction after operation, and the effects of the anæsthetics, note the degree of surgical fever if any. Always make a systematic examination of the urine in cases for operation.

CHAPTER XIV.

SIMPLE RULES FOR THE CLINICAL EXAMINATION OF CASES OF DISEASES OF THE EYE.

BY SURGEON-MAJOR E. F. DRAKE BROCKMAN, F.R.C.S.

When recording a case of eye disease, the following points merit notice, regarding which existing facts should be noted, in addition to those furnished by the patient. It sometimes occurs that most of the latter have passed away at the time of the examination by the student, without leaving any evidences of their former existence.

The outward bearing of the patient.—(*a*) Note whether he is intolerant of light or in other words suffers from photophobia as a symptom; (*b*) whether lacrymation is present (*c*) whether the eyelids are kept closed and at the same time shaded by the hand, or whether they are widely opened; (*d*) whether the head is maintained in an erect position, or is depressed with the chin resting on the sternum; (*e*) when standing or walking, note whether there are any evidences of impaired nervous function in any of the organs of locomotion; (*f*) judge by the external appearances of the patient whether pain is present or not.

The eyelids, and external parts surrounding the orbit. Note as regards the *latter,* (*a*) the presence or absence of cicatrices from wounds or from herpetic eruptions, or from small-pox, and (*b*) any evidence of former treatment as blister-marks, leech bites, or seton marks.

As regards the *former,* (*a*) the presence of swelling whether general to both eyes and both eyelids, or whether limited to one eye or one eyelid; (*b*) the condition of the tarsal margins, and the presence of scabs or of concretions at the roots of the cilia; (*c*) as to the direction of the edges and whether deprived of the cilia or otherwise; (*d*) the presence of any tumor in the structure of the lids; (*e*) whether the puncta lacrymalia retain their normal position or not; (*f*) the state of the canthi and the caruncle; (*g*) the presence of a tumor occupying the position of the lacrymal sac; (*h*) whether any discharge exudes from between the margins of the eyelids, and its nature.

N. B.—The investigation up to this point can be conducted during a conversation with the patient or his friend, without a manual examination of the parts.

Note (*a*) its condition of congestion or otherwise, and whether associated with ciliary congestion; (*b*) the secretion, if any, on its surface and its character; (*c*) the dryness of the membrane; (*d*) the presence of any growth, such as pterygium or polypus or wart; (*e*) the presence of pustules.

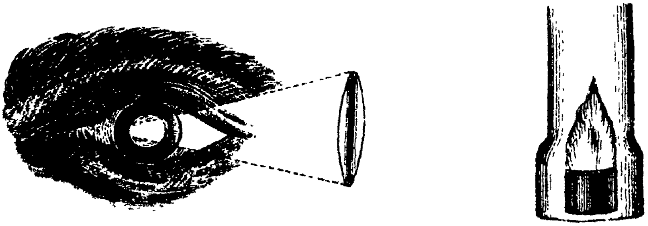
N. B.—At this point close the eyelids and ascertain the tension of the eyeball by palpation, and note whether there is a + or — degree present, or whether it is normal. Next evert the eyelids for the examination of the palpebral conjunctiva, and the retrotarsal folds. Note the following fact in regard to these parts :—

(*a*) The condition of the surface of the membrane as to the existence of papillary granulations or trachoma; (*b*) as to cicatricial tissue; (*c*) the lodgment of any foreign body in the retrotarsal folds; (*d*) the signs of meibomian cystic tumors, or calcareous deposits in the meibomian ducts.

The cornea—(*a*) carefully note its transparency and the smoothness or roughness of its surface; (*b*) the presence of vascularity—pannus—or of ulcers; (*c*) the lodgment of any foreign body, as dust, iron or glass, on its surface or impacted in its structure; (*d*) the presence of phlyctenulæ or their sequelæ as opacities from cicatrisation; (*e*) the presence of staphylomata whether partial or complete; (*f*) wounds or injuries accidentally or purposely inflicted.

N. B.—For the more complete examination of this and the deeper structures, the oblique method of examination is useful and almost indispensable.

FIG. 4.



The oblique or focal illumination—[SCOLBERG WELLS.]

The Iris.—(*a*) record the state of contraction or dilatation of the pupil, and whether such state is of a temporary or permanent character; (*b*) the mobility of the pupil under the influence of light; (*c*) the depth or shallowness of the anterior chamber; (*d*) the presence of anterior or posterior synechiæ; (*e*) the appearances of the stroma of the iris, as to the distinctness of the muscular fibrillæ, the condition of the blood vessels together with the presence or absence of the congested ciliary vessels around the corneal circumference; (*f*) the existence of plastic or syphilitic deposits on the anterior surface or in its structure, or of the formation of cystic or other tumors; (*g*) as to any congenital absence in part—as coloboma—or its rupture either in its continuity or at its ciliary margin—iridodialysis.

The lens and its capsule.—(*a*) as to their transparency or otherwise; (*b*) the character and situation of the opacity as to whether central or peripheral; whether at the poles or at the equatorial region; (*c*) as to the opacities being in the form of specks or lines; (*d*) whether limited to the lens or involving the capsule; (*e*) the history of the patient for the determination of the congenital or senile forms, or to determine its idiopathic or traumatic origin; (*f*) position of the lens whether dislocated partially or completely in any direction; (*g*) the existence of any wound to the capsule or the lens structure.

N. B.—Examination by the oblique illumination and by the ophthalmoscope with the previous instillation of atropia facilitates the investigation into the case.

Post-ocular diseases.—These include diseases of the vitreous, retina, optic nerve, choroid and sclerotic coats, and the posterior part of the eyeball. Besides the general subjective symptoms furnished by the patient, some of which are common to each and all of these structures, the objective signs must be made out by the aid of the ophthalmoscope, in order to define and limit the diseased action to one or more of the deeper structures.

In all these diseases the visual power is more or less impaired. Note therefore (*a*) by a rough method the degree of vision at distance for any large object held before the patient; and (*b*) in a more exact manner by means of test types-Snellen's or Jagers; (*c*) the extent of vision may be estimated by the use of a perimeter; (*d*) the abnormal refraction—myopia, hypermetropia, astigmatism or presbyopia—by special test objects.

THE OPHTHALMOSCOPE.—The form of instrument in most frequent use consists of a small concave mirror having a small orifice perforated at its centre, and set on a handle. Together with the mirror is a biconvex lens of about 2¼ inches focal power. In other forms of the instrument, 3 or 4 auxiliary concave and convex lenses are supplied for fixation in a metal clip behind the mirror. These are useful in determining any abnormal refraction in the examined eye, or to correct any form of ametropia in the eye of the observer.

Method of using the instrument.—The instrument may be used in two ways, *viz.*, by employing the mirror alone, and by using in addition the 2¼ convex objective lens. The former method is called the *direct method*, and the latter the *indirect method* of examination.

Direct method.—The patient being seated opposite to the observer whose head must be on a higher level, and a lamp having been placed on a table to the left of the patient on a level with his left eye and somewhat behind his head, the rays of light from the lamp are received by the ophthalmoscopic mirror which is held in the right hand, and are reflected into the eye under observation. The observer at this time, on looking through the central orifice in the mirror, will notice an orange-red reflection from the fundus of the patient's eye if an European, and a darker reflection, if a native. In the examination of the left eye, the patient should look at the left ear of the observer, and in examination of the right eye, at the right ear of the observer. The eye when so directed, will expose to illumination the optic disc.

As soon as the red glow is visible, the observer advances his eye gradually towards the patient's eye until he approaches it to about 2 or 3 inches. If the refraction of the eyes of both patient and observer is normal—emmetropic—an upright image of the fundus, magnified by the crystalline lens of the patient's eye, will be clearly seen, and the optic papilla with the arteries and the veins proceeding from and to it as a centre, can be distinctly seen, the arterial vessels being smaller in calibre, lighter in color, and bounded by a double contour; the veins being wider, darker in color, and devoid of the double marking. Any movement of the head of the observer to the right or left causes an apparent movement of the illuminated fundus in the same directions.

If the eye of either the patient or observer be ametropic in the direction of hypermetropia, the erect image of the fundus will be visible at any distance beyond 2 or 3 inches, according to the degree of the error of refraction present. Movement of the observer's head to the right or left, in this case will also produce apparent movements of the illuminated fundus in similar directions.

Again, if the eye of either observer or patient is ametropic in the direction of myopia, an inverted image of the fundus will be obtained at any distance beyond 3 inches from the eye under examination, according to the degree of the existent myopic refraction. In this case, the movements of the observer's head in one direction causes an apparent movement of the fundus of the patient's eye in the opposite direction.

In astigmatism, whether myopic or hypermetropic, simple or compound, the same rules obtain as regards the distance at which the details of the patient's fundus become visible.

If the observer suffers from ametropia in any of its forms, the necessary correction must be made by means of appropriate convex or concave lenses fixed behind the mirror of the ophthalmoscope. The *direct method* is most useful when a limited and enlarged view of a portion of the fundus is required to be made. This is the more difficult method of examination for beginners in the use of the instrument.

Indirect method.—The rules as laid down for the examination by the direct method hold good here. In addition, however, the 2½ bi-convex lens which is in the opthalmoscope case must be employed in the *indirect method.* While a steady light is thrown into the fundus from the mirror, the bi-convex lens is taken between the forefinger and thumb of the left hand of the observer, and resting the little finger on the brow of the patient over the eye undergoing examination, the rays of light reflected from the fundus of the patient's eye are condensed and an inverted image—aerial—becomes visible. This image is situated between the ophthalmoscopic mirror and the bi-convex lens.

The ametropic condition of the patient's or observer's eye does not affect, in any material degree, the picture so obtained.

This method of examination is useful in those cases in which it is necessary to obtain a view of a larger surface of the fundus than can be got by means of the direct method.

The difficulties—if they can be so called—in prosecuting this method of examination consist in the harmonious action of both hands in the manipulation of the mirror and the bi-convex lens, simultaneously. As the image is an inverted aerial one, every movement of the hand holding the bi-convex lens will cause an apparent movement of the fundus in an opposite direction.

CHAPTER XV.

ON THE EXAMINATION OF THE EAR.

Having ascertained the history of the case, and observed the state of the general health of the patient, test the amount of hearing and make a note of it. This is best done by means of the observer's voice, in "a whisper," "conversation voice," or "loud voice" if necessary. If the patient can hear a whisper at a distance of ten feet with the opposite ear closed, the hearing may be put down as normal; note the character of the voice and the distance it can be heard. If there is deafness in one ear, you can test it with the "tuning fork" which, if made to vibrate, placed on the vertex, or incisor teeth, will be heard in the ear closed with the finger if there is any sense of hearing left in it.

First examine the auricles and the state of the skin surrounding them, and over the mastoid process.

Examination of the external meatus.—The auditory canal is in the adult about an inch and a half long; its course is inwards and slightly forwards, it presents a slight curve with the convexity upwards, and is narrowest about its middle, it may be said to have three divisions, which differ in structure and appearance. In the outermost part of the tube, the passage is formed almost entirely of fibro-cartilage, and lined by the same dermal structure that invests the auricle. The skin is studded over with fine white hairs pointing inwards, and also with numerous subaceous glands. It is here more loosely connected to the cartilage than at any other part of the tube, and this accounts for the fact that small abscesses occur in this part of the canal more frequently than any other. The middle portion of the meatus is the seat of the ceruminous glands that secrete the ear wax; this is about three-eighths of an inch long, and is the narrowest portion of the tube. Its walls have less cartilage, and more dense fibrous membrane in their composition, and its dermal lining is finer. When in a healthy state, it is generally lined with wax, which forms a thin coating on this part of the meatus. The third and last portion of the passage is slightly dilated, and its walls consist of bone covered with a thin dermoid layer. This part of the meatus, like the membrane tympani, can only be seen satisfactorily by means of a speculum, the best of which is a silver tube of conical form, (Wilde's) with its small end of a round shape, or Brunton's speculum may be used. The best means of making the examination is either to utilize the rays of the sun reflected from a looking-glass, placed outside the room in the sun, or the light from a window reflected by a hand-mirror, or by the mirror of a laryngoscope placed on the forehead. With Brunton's speculum the reflected rays from a looking glass or the direct rays of the sun may be used.

With the ordinary speculum the observer should take the auricle with one hand, and draw it gently outwards and backwards, whilst with the other he inserts the speculum as far as it will go without pain. Then by gently moving the large end of the speculum from side to side, a stream of light may be made to play on the innermost portion of the meatus, and on the membrana tympani. When the innermost portion of the meatus is thus examined, its lining exhibits, if healthy, a dry pearly white shining appearance; in various conditions of disease it is more or less red and vascular, or villous and granular. and may secrete pus, or throw of thickened epidermis. The membrana tympani is also seen closing the passage obliquely. It is of a bright semi-transparent appearance, and slightly concave externally. It is divided into two parts by the handle of the malleus, which in its perfectly healthy state is very distinctly seen, slanting downwards and backwards to a little below the centre. A little behind and below this bone, the membrane presents a brighter spot, of triangular form, due to the reflection of the light. In morbid conditions, affecting the polish or curvature of the membrane, this spot presents various changes.

The observer should note the size and calibre of the canal, the presence or absence of foreign bodies, or of cerumen, and the condition of the lining membranes. In examining the membrana tympani the points to be noted are its colour, transparence, lustre, light cone, inclination, curvature, entirety, tension, whether adhesions are present or not, and the position of the malleus, especially of its short process. If it is perforated, or you suspect it is, ask the patient to drive a current of air by a forcible expiration through the Eustachian tubes, the nostrils and lips being held firmly closed.—*Valsalva's method.*

Politzer's method of examining the middle ear consists in passing the soft nozzle of a caoutchouc bag filled with air into one or other nostril of the patient, and while he swallows a mouthful of water, or blows forcibly from the mouth, compressing the nostrils with the fingers of the left hand so as to prevent the exit of air through them. At the same time the right hand forcibly expels air from the bag in such a way that finding no passage open except the Eustachian tube it rushes up there, passes into the tympanic cavity and pushes out the membrana tympani. It is this sudden rush of air against the external wall of the cavity, which the observer listens for by means of a *tube* of India rubber, passing from the ear of the patient to that of the Surgeon. Should the membrana tympani be perforated, a hissing or blowing sound will be heard.

The use of the other more complicated instruments for the diagnosis of disease of the middle and internal ear require demonstration for the student to understand, and much practice to enable him to use them.

Eustachian catheter.—Dr. Purves* gives the following directions for passing this instrument. It should have a curve with an obtuse angle of from 110° to 120°. The patient ought to be placed with the external opening of his nares horizontal, and opposite to the right shoulder of the operator, who, titling the point of the nose upwards by the fingers of the left hand, discloses the cavities of the nares more fully, upon the floor of one of which (the right being preferable) he places the beak of the instrument. Keeping the beak on the floor, he passes it through the cavity and onwards across the pharyngeal space, till it comes against the posterior pharyngeal wall, which in its normal condition, gives him much the same feeling of resistance as he receives on pressing the catheter against the tense open palm of the hand. Drawing the catheter towards him, and at the same time elevating the end which he holds in his hand, he brings the concave curvature of the opposite end against the posterior edge of the nasal floor, and then turning the beak outwards and upwards, keeping it at the same time against the external lateral wall of the pharynx, he will feel it make a slight dip into the pharyngeal opening of the Eustachian tube. He knows that the nozzle has passed well into the mouth of the tube, by the position of the catheter not being disturbed when the patient speaks or swallows, by the fact that the nozzle will not pass further upwards, and especially by the fact that on blowing air into the catheter, either by mouth, or by an India rubber bag, you recognize its passage into the tympanic cavity of the patient by having placed a tube of communication from your meatus to the patient's as in Politzer's method. Great gentleness and patience are required in passing it. It is often of use in the diagnosis of deafness from obstruction of the Eustachian canal, or in perforation of the membrana tympani.

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* Bryant's Practice of Surgery, 1876.

CHAPTER XVI.

ON THE EXAMINATION OF THE THROAT.

To examine the throat well the nose should be held so as to compel breathing through the mouth. The forefinger can be passed into the throat, beyond the epiglottis as low as the bottom of the cricoid cartilage, and thus search the pharynx down to the top of the œsophagus, and the hyoid space (on each side) where foreign bodies are so apt to lodge*

The use of the laryngoscope is not at all so difficult to acquire as students generally imagine. The instrument generally supplied in this country consists of two parts, three small mirrors, (the medium sized one being the best, for ordinary use) which are fitted to a long slender shank for the purpose of enabling them to be introduced into the back of the throat, and a larger mirror to be fixed to the head of the observer for the purpose of reflecting light upon the mirror in the throat. The best light to use is that of the sun the rays of which can be easily reflected into a room or verandah by means of an ordinary looking-glass. It is sometimes necessary to use artificial light, when a lamp with a good steady bright flame should be chosen. This should be placed behind the patient's head a little to one side. The first thing for the observer to do is to manage to reflect the light from the mirror on his head (I find it best to fix it on the centre of my forehead so as to use both eyes) into the open mouth of the patient, having done this, the patient should then be directed to protrude his tongue, which the observer should catch gently but firmly between the finger and thumb of his left hand guarded by a towel or soft cloth to prevent the tongue slipping. The observer should then take the small laryngeal mirror and warm its reflecting surface either in warm water or over the chimney of the lamp (to prevent the moisture of the expired air being condensed on it). Before introducing it the observer should touch it to his own cheek in order to see that it is not too hot. The mirror should be held like a pen in the right hand and steadily introduced to the back of the throat, its face being directed downwards, and kept as far as possible from the tongue. The posterior surface of the mirror should rest on the uvula, which should be gently pushed rather upwards and backwards towards the posterior nares. When the mirror has been thus introduced without irritating the fauces, the observer should raise his hand slightly and direct it outwards towards the corner of the mouth. This rotatory movement alters the inclination of the mirror turning its face more towards the perpendicular, and thus bringing the larynx into view, while at the same time it moves the hand from the line of vision. The exact angle which the mirror should bear to the laryngeal aperture must depend upon the degree of flexion backwards of the patient's head, the particular angle which the plane of the laryngeal aperture bears to the horizon in the case undergoing inspection, and on the position of the observer, but a little practice soon enables one to find it out. Considerable faucial irritability may exist and other conditions uncontrollable by the observer, but in most cases examinations are possible and when not so it is generally the fault of the observer, either he has allowed a timid patient to become frightened or he has tickled the fauces too much with the mirror. When the larynx can be seen the action of the. vocal cords may be observed by asking the patient to inspire deeply, or to produce some vocal sound such as "Ah" "Eh" "Oh." The beginner must remember that in examining the larynx the objects are reversed in the mirror, *not as regards right and left,* but with reference to the *antero-posterior* direction, the part which in reality is the nearer to be observed, the anterior commissure of the vocal cords, becomes the further in the image, and the posterior or inter-arytenoid commissure, which in reality is the further, becomes the nearer in the image.

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* Holden's Landmarks Medical and Surgical, 1881.

The general appearance and relation of the parts in the throat and larynx are best learned in the anatomical theatre, and by the examination of some living subject whom it does not distress. The living parts present the following colours in health. The lingual surface of the epiglottis appears of a yellowish or pinkish drap colour. Its upper border is decidedly yellow. Its laryngeal surface especially the cushion, varies from a pinkish yellow to a deep pink, sometimes it appears quite red—so bright indeed, as to suggest the idea of the existence of an inflammatory condition. The arytæno-epiglottidean folds are pale pink, they have been described as about the same colour as the gums. The mucous membrane covering the arytænoid cartilages is also pink, but of a somewhat deeper tint. The false vocal cords are perhaps a slightly deeper pink still. The true vocal cords are distinguished by their glistening pearly whiteness, but sometimes they are slightly greyish. The cricoid cartilage is recognized by its well marked yellowness. The tracheal cartilages appear of a yellowish drap colour and between them the mucous membrane is pale pink—(Durham).

Rhinoscopy.—The smallest laryngeal mirror is introduced into the back of the throat, between the anterior pillar of the fauces and the uvula, on one side first, then withdrawn and placed in the same position on the other side. It should be held so that the plane of its reflecting surface forms with the horizon an angle of 130 degrees. In this way with the light reflected from the larger mirror on his forehead, the observer will be able to inspect the whole of the posterior nares, and by first slanting the mirror a little towards one side, and then towards the other, the orifices of the Eustachian tubes will become visible. The anterior nares may be very fully examined by means of an ordinary bi-valve nasal speculum.

The Surgeon's finger should be familiar with the feel of the posterior nares, and of all that is within reach behind the soft palate.

CHAPTER XVII.

ON THE EXAMINATION OF THE RECTUM.

Bryant* says that the best position is on the side, with the legs well drawn up and the thighs flexed upon the abdomen, the hips being brought to the edge of the bed or couch in a good light; with one hand the observer having uncovered the parts sufficiently to expose them, may then raise the upper buttock, and in doing this the anus comes well into view, in operations this may be done by an assistant. When an abscess exists, it will then be seen, if a fistula be present, its external orifice will be apparent. Fissures, warts, condylomata, or fleshy flattened cutaneous vegetations, or cancerous tubercles will also be at once recognized.

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* Practice of Surgery, 1876.

Pendulous loose folds of skin about the anus will suggest the former existence of external hæmorrhoids, blue turgid venous projections, their present existence. A tightly contracted and rigidly drawn up anus, as a rule, means some painful ulcer of the part, and a patulous anus through which flatus or discharge passes without the patient's wish, too often means extensive rectal ulceration or stricture.

Internal piles when prolapsed will appear as turgid, vascular, mucous projections, surrounded by everted integument more or less œdematous, and covered with mucus or blood, prolapsus recti as a greater or less annular projection of smooth or rugous mucous membrane with a central intestinal orifice. A polypus projecting will appear like a cherry, surrounded by healthy structures. All these points are taken in at a glance and interpreted. A digital examination is then to be employed to confirm or refute the suggestions thus taken in by the eye. To do this well, the index finger and if necessary the second finger, should be thoroughly oiled, it being a good plan to previously fill the nails with a little soap; the index finger thould. then be applied to the anus, and the patient told to bear down, in doing this the sphincter is relaxed. The observer may then with ease, and without causing pain, introduce his finger. When an ulcer exists at the anus, pain will be caused by, and there will be spasmodic resistance to, the introduction of the finger, with the pulp of the finger slowly moved round the anus the ulcer will probably be felt, it should be stated, however, that in many cases such ulcers will be seen by the careful drawing down of the skin of the anus till the margin of the mucous membrane becomes visible. A spongy nodular feel of the mucous membrane just within the sphincter will suggest internal hæmorrhoids, a local, tender, and raw surface will be probably a syphilitic sore, while a cancerous ulcer is known by an infiltrated, nodular, and thickened surface. A stricture within two inches of the sphincter can always be detected by its anular form or the obstruction which it causes. When a healthy piece of bowel separates the anus from the stricture or ulceration, the probability of the disease being cancerous is rendered great. Where no such healthy tissue exists, syphilitic disease is rendered probable. A digital examination will always detect the presence of scybalæ or impacted fæces, and also the encroachment of uterine or pelvic tumours in women, and prostatic tumours in men. The introduction of the second as well as the index finger sometimes permits of a greater rainge of exploration. The whole hand has been introduced into the rectum for the purpose of exploring it and examining the contents of the pelvis generally. This should be done with the patient under chloroform and can only be done safely by a Surgeon who has not too large a hand. Eight inches round in measurement is said to be the largest hand that can be safely introduced. When this mode of examination is possible, much information can be acquired, if the relative anatomical position of the different parts contained in the pelvis is kept in mind.*

To confirm the opinions thus formed a speculum may be used, this should be well warmed and greased, and introduced in the same manner as the finger. Mr. Alingham advises the prone position, with the hips well elevated upon hard pillows, to such an inclination that the intestines will gravitate towards the diaphragm, so that when expiration takes place, the rectum becomes patulous, and you can see as far as the sigmoid flexure perfectly and distinctly.

CHAPTER XVIII.

ON SOUNDING THE BLADDER.

The physical diagnosis of stone in the bladder can only be settled by the sense of touch and hearing.

The instruments used for 'sounding' the bladder are called 'sounds' they are in shape somewhat similar to catheters both in size and form, but are made of solid steel well polished on this exteriors, their length and size varying according to the age of the patient undergoing examination. The handles of these instruments are expanded and flattened, in order to give a larger surface for the fingers and thumb of the operator to receive tactile vibrations. The curve of the sound is generally that of an ordinary catheter, some prefer it shorter curving at an angle of 45°, and others almost straight, except at its lower extremity where it is bent or curved, and made somewhat bulbous. The reason why catheters are not ordinarily used is, that they are bad conductors of sound, and the presence of the stilette in the instrument may give rise to a rattling noise, which would be a source of fallacy. A sound with a large curve may glide over a calculus when it is lodged in a depression behind the prostate, or above and behind the pubis, hence in such cases, one with a short beak and at right angles should be employed.

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* See Holden's Land marks, Medical and Surgical, 1881.

These sounds are generally supplied in the lithotomy cases, if no sound is available, a large silver catheter may be used for the purpose. Mr. Bryant* recommends that a hollow sound or catheter without a stilette should be used as he points out that sometimes as the bladder is being emptied the stone falls forwards on the catheter showing its presence.

The late Mr. F. L'Estrange of Dublin invented a small sounding board to be fastened to the top of the sound for the purpose of intensifying the noise produced by the sound when it strikes the stone, I have seen this of much use in an obscure case.

' The normal calibre of the urethra may be estimated by a rule based upon the proportionate relation which the urethra has been found to bear to the size of the organ in which it is situated. Thus, if the flaccid penis measures 75 mm., or 3 inches English, in circumference, the urethra will be found to have a normal capacity of 30 mm., in circumference. If the penis measure 81 mm., or 3¼ inches English, the urethra will have a capacity of 32 mm., and so on ; 6¼ mm., or ¼ of an inch, increase in the circumference of the penis, at about the middle of the pendulous portion, will indicate an increase in size of the urethra of 2 mm., the range of the normal urethra, as demonstrated by measurements in several thousands of cases being from 28 to 45 mm. in circumference.'—*Professor Otis, Transactions International Medical Congress,* 1881, *page* 320, *vol. II.*†

Poland‡ recommends that the position of the patient in sounding should be the recumbent one, if necessary a pillow being placed under the pelvis, in obscure cases it is necessary to vary this, and even to explore in the standing posture. The rectum should have been previously washed out by an enema, the bladder should be moderately distended with urine from three to six ounces being enough. If the bladder is empty, a little warm water should be injected.

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* Practice of Surgery.

† 1 Millimetre = ·039871 of an English inch.

‡ Homes System of Surgery.

The sound should be introduced carefully and slowly, and allowed to glide along the canal by its own weight, no force whatever is required, and in general no pain need be given. Should there be an organic stricture of the urethra it should be dilated beforehand. Having passed into the bladder, the point of the instrument is to be made to move gently from before backwards, then from side to side, and afterwards rotated slightly on either side, assisted at the same time by a partial withdrawal and reintroduction of the point of the instrument. The Surgeon should always *hear* as well as *feel* the stone. The operation may be facilitated in obscure cases by the introduction of the finger into the rectum, or by making pressure by the hand above the pubes, both if necessary being done together. The introduction of the hand into the rectum as mentioned in the chapter on the examination of that organ may be of use in obscure cases. In consequence of there being generally some fulness about the rectum, the stone is found sometimes lodged on the right side, large calculi are generally near the neck of the bladder, small and medium sized, calculi lie at the base to the right or left side. An encysted stone is a rarity. A stone may be felt at one time and not at another. When an enlarged prostate exists and the stone is not felt, the bulbous portion of the sound should be turned right round in order to explore behind the enlarged gland. The size, number, situation and density of the stone or stones should be if possible ascertained. The size may be judged by moving the end of the sound over the surface of the stone but can only be accurately done by means of a properly graduated lithotrite. If there are many stones—which is rare—it is impossible to say more than that they exist. The density may to a certain extent be judged by the sound, small and very moveable calculi give but a feeble sound, smooth and dense calculi, as lithic acid and oxalate of lime, give a clear, ringing, sonorous character, the light friable, and irregular ones, as the phosphates emit a dull and scarcely appreciable sound. The smooth surface of a lithic acid stone, and the rough irregular exterior of the oxalate of lime, may in some instances be detected by the instrument.

The situation of a stone may be likewise made out, as to its being loose or free, or fixed and encysted, whether it be on the right or the left side, at the base or in the walls, or in the upper part of the bladder. A rectal examination will help in settling the number of the stones and their position when it is possible to carry it out.

The value of chloroform in facilitating the operation of sounding, especially in children, very nervous persons and when there is much pain or spasm of the urethra or neck of the bladder is so great that it should always be used in such cases.

The difficulties and sources of fallacy in sounding are many. A stone may be detected one time and not at another, owing either, to its smallness, or, to its being temporarily caught up in the folds of the bladder, in fact small stones easily escape detection and readily recede before the sound when the bladder is moderately full of urine, hence in such instances the change from the recumbent to the erect posture may allow the stone to fall on the sound; or again, if the sound is a hollow one, the evacuation of the urine may cause the stone to be felt. A large and deformed bladder increases the difficulty, so does a sacculated or encysted bladder,—an irregular hour glass contraction of the bladder,—calcareous matter adhering to the walls of the bladder,—an enlargement and roughing of the prostate gland—calculi in the prostate and urethra, and tumours at the neck of the bladder. The calculus may be coated with blood or mucus. Some of these difficulties may be overcome by varying the position of the patient, by the use of sounds of different sizes and curves, and by moderately distending the bladder when necessary with two or three ounces of tepid water. A calculus may generally be known to be *encysted,* if the sound strike it at times, but not at others, if the stone always appears to be fixed in one situation, and if the beak of the instrument cannot be made to pass round it, so as to isolate it, but a kind of tumour projecting from the walls of the bladder is felt, around or on one side of the point where the calculus is struck. Sounding may produce cystitis and peritonitis, hence caution and gentleness are necessary in its use especially where there is any organic disease of the kidneys.

In women the diagnosis of vesical calculus is more easily made than in man. The *sound* used should be shorter and less curved. Vaginal examination by means of the finger gives great help. In female children the finger should be passed into the rectum which does quite as well.

In the *Lancet* of the 6th May 1882, page 724, Sir H.

Thompson recommends in certain cases the digital exploration of the bladder through a small vertical median incision in the perinæum by means of which the empty bladder can be fully explored with safety to the patient.

CHAPTER XIX.

ON THE EXAMINATION OF THE EXCRETA.

The Urine.

The following notes principally from Doctor Wickham Legg's Guide to the examination of the urine will be found useful.

Urine varies in colour from pale yellow to clear amber yellow, or reddish-yellow, but it may be as colourless as water, or dark brown like porter, a smoky tint is diagnostic of the presence of blood, a brownish green suggest the presence of the colouring matter of the bile. Many drugs, as rhubarb, logwood, saffron, and santonine, give a peculiar red colour to the urine, carbolic acid a black colour, and tannin given by the mouth renders it colourless.

A pale urine is seen in health as the *urina potus*, and in disease in anæmia, diabetes, nervous disorders as hysteria, and convalescence after fever or acute diseases. A pale urine contains little colouring matter, and but a small proportion of solid constituents, always excepting, however, the urine of diabetes mellitus. A pale urine is a sign that the patient is not suffering from any high degree of pyrexia. A high coloured urine occurs in health, after food as the *urina cibi*, and after strong exercise; and in disease, in fevers, and most acute diseases, in which considerable metamorphosis of the tissues takes place. It contains much colouring matter and urea in proportion to the water. A dirty bluish urine is sometimes seen in cholera and typhoid fever.

Translucency.—In health, the urine deposits after remaining at rest for a short time, a slight cloud of mucus derived from the bladder and urinary passages, but in all other respects healthy urine is perfectly clear. On cooling, however, it sometimes becomes turbid from the presence of urates, which are distinguished from other deposits by their appearing upon the cooling of urine which was perfectly clear when first passed. Should the urine be turbid when first voided, it is a mark of disease and pus is the most frequent cause of this appearance.

Odour.—It is not yet ascertained to what substance the peculiar smell of the urine is due, nor is it of much importance to the clinical student. When the urine loses its natural smell and becomes fœtid and ammoniacal, the change is due to the decomposition of the urea into carbonate of ammonia, and the formation of sulphur compounds; in cases of cystitis, and paraplegia the alteration begins very quickly after, if not before, it is voided. Various drugs as cubebs, sandal wood, and turpentine give a characteristic smell to the urine.

Consistence.—The urine is a limpid fluid flowing freely from one vessel to another. But in catarrah of the bladder, the ammoniacal products of the decomposition of the urea renders the pus thick and viscid, thus causing the secretion to be ropy and poured with difficulty from one vessel to another. Chylous urine becomes quite solid soon after being passed.

The froth on normal urine readily disappears, but if the froth be permanent, the presence of albumen, or of the constituents of the bile, may be suspected.

Specific gravity.—Varies in health between 1015 and 1025, it should be tested by the urinometer (graviometer, Madras nomenclature) either glass or brass, the former is preferable as the other is scarcely ever right, either of them should be tested in distilled water before being used. The specific gravity of the portion of the whole quantity passed during the previous twenty-four hours should be tested, that of a small quantity taken by chance is of little use.

Sugar in the urine is the most common cause of a high specific gravity, if it is not present, an excess of urea will be the probable cause.

A low specific gravity, below 1010, occurs after fluid has been taken in quantity. A low specific gravity is also frequently noticed in chronic Bright's disease, immediately after the paroxysm of hysteria, in anæmic states, in diuresis from any cause such as mental emotion, or exposure to cold. It is often seen in natives when they are leading an inactive life.

A high specific gravity, with a pale colour, and a low specific gravity with a deep tint, are equally signs of disease.

Reaction.—Urine is almost always secreted acid, although it may become alkaline within a very short time of being passed. In the majority of cases in which the urine is said to be alkaline, as in paraplegia, and cystitis, the alkalinity is really due to decomposition after being passed. If the urine then, be found to be alkaline, a fresh specimen should be tested immediately after it has been voided. In cases of retention the urine sometimes becomes alkaline in the bladder, and in health, can be made alkaline, by the administration of drugs such as the carbonates, acetates, citrates, or tartrates of the alkalies.

When the alkalinity of the urine is due to ammonia, the brown colour of the turmeric disappears when the paper is exposed for some time to the air, or gently heated; but the change from yellow to brown is permanent, if the alkalinity is owing to either potash or soda.

Urine is rarely neutral in reaction.

The cause of the acid reaction of the urine is the presence of the acid phosphate of soda, and according to some observers, of free lactic and hippuric acid. Very shortly after being voided the acidity increases, and lasts in health in a cold climate for days, free uric acid being often thrown down.

Sooner or later, however, the alkaline fermentation sets in, and the urine becomes ammoniacal and fœtid from the conversion of urea into carbonate of ammonia, and the formation of sulphide of ammonium, while the phosphates and urate of ammonia are deposited as a white sediment.

Clinical import.—The acidity of the urine is decreased during digestion and increased by fasting or perspiration. A very acid, high coloured urine is associated with the "Uric acid diathesis." This condition favours the occurrence of calculus and gravel.

Alkalinity of the urine, if no alkalies have been administered, is due to the decomposition of urea into carbonate of ammonia. It is present in some diseases of the spinal cord, and especially in chronic affections of the bladder and urinary organs, as a few drops of urine which have undergone the alkaline fermentation will rapidly the same set up change in fresh urine. When the alkalinity of the urine is due to fixed alkali, either potash or soda, it may be due to a catarrh of the urinary passages, the injection of alkaline salts, or some alteration in the metamorphosis of the tissue. About this last condition little is known with certainty. It is always best treated by meat diet and iron.

The following apparatus and reagents are required for testing urine :—

Cylindrical urine glasses each containing about six fluid ounces. Urinometer, (graviometer, Madras nomenclature) the stem of which is graduated from 1,000 to 1,060. Blue and red litmus, and turmeric paper. Test tubes, a spirit lamp, nitric acid, acetic acid, liquor potassæ or liquor sodæ, solution of sulphate of copper ten grains to the fluid ounce, or Fehlings test solution for sugar, a glass funnel, filtering paper, and a microscope.

SCHEME FOR THE EXAMINATION OF THE URINE.

The following plan should always be followed in examining urine and notes made accordingly :—

1. Observe the colour of the urine, its odour, and its appearance as to translucency, consistence, &c.

2. Measure the quantity passed in the previous twenty-four hours.

3. Ascertain the specific gravity of a specimen of the whole quantity.

4. Examine the reaction, whether acid, neutral, or alkaline, by means of litmus or turmeric paper.

5. Test the urine for albumen, (page 169). If albuminous, look with the microscope for—renal casts; pus corpuscles; red blood corpuscles.

6. Test the urine for sugar, (page 171).

7. If there be no albumen or sugar present, and no deposit, the urine need not be further examined, unless some special indication exists.

8. But if any sediment be observed, it must be examined with the microscope. The following enumeration of the more common deposits may help the student :—

Pink or reddish deposit, dissolved on heating test-tube—urate of soda.

White crystalline deposit, soluble in acetic acid—phosphates.

Hummocky white sharply defined cloud, insoluble in acetic acid—oxalate of lime.

White amorphous flocculent deposit, rendered ropy, viscid, and gelatinous, by about half its quantity of liquor potassæ—pus; if it is not rendered ropy but becomes fluid and limpid—mucus.

Brownish-red crystalline deposit—uric acid.

Red amorphous deposit—blood.

For plates of these deposits, see end of chapter.

Table showing the amount of Urinary Constituents excreted by a Grown-up Man in the twenty-four hours.—" PARKES."

Quantity ...	... 40	to	50	fluid ounces.
Total solids ...	... 800	to	1,000	grains.
Urea	... 350	to	600	,,
Uric acid ...	... 5	to	15	,,
Chlorine ...	... 50	to	150	,,
Phosphoric acid	... 30	to	60	,,
Sulphuric acid	... 20	to	60	,,

Specific gravity from 1,012 to 1,025—average 1,021.

Specific gravity varies nearly in inverse ratio to quantity, according to season, period of the day, kind of food, &c. Urina sanguinis (morning) is 2° to 3° higher than after food, or at night.

Rules for calculating the amount of solids in urine.

The solids in a fluid ounce of urine represent, nearly as many grains as specific gravity exceeds 1,000: thus, urine, specific gravity 1,015; quantity 60 ounces in 24 hours; 60 × 15 (or more correctly 15·517) = 931·020 grains of solids in the twenty-four hours. This, however, is only an approximation. When taking the specific gravity, the temperature of the urine should be that of the surrounding atmosphere, otherwise great errors may creep in.

Another rough method of calculating the solid matter passed is as follows, the two last figures of the specific gravity are multiplied by 2, or more correctly 2·33, which gives the amount of solid matters in 1000 parts of urine; if for example, the specific gravity is 1020 then 1000 grains of urine will contain 2 × 20 = 40 grains of solids, or by multiplying by 2·33 = 46·6.

Table of the quantity of solids in a fluid ounce of Urine according to its specific gravity (from Dr. Christison.*)*

Specific gravity.	Weight of fluid ounce in grains.	Solids in fluid ounce in grains.	Specific gravity.	Weight of fluid ounce in grains.	Solids in fluid ounce in grains.
1,010	441·8	10·283	1,025	448·4	26·119
1,011	442·3	11·336	1,026	448·8	27·188
1,012	442·7	12·377	1,027	449·3	28·265
1,013	443·1	13·421	1,028	449·7	29·338
1,014	443·6	14·470	1,029	450·1	30·413
1,015	444·0	15·517	1,030	450·6	31·496
1,016	444·5	16·570	1,031	451·0	32·575
1,017	444·9	17·622	1,032	451·5	33·663
1,018	445·3	18·671	1,033	451·9	35·746
1,019	445·8	19·735	1,034	452·3	36·831
1,020	446·2	20·792	1,035	452·8	37·925
1,021	446·6	21·882	1,036	453·2	38·014
1,022	447·1	22·918	1,037	453·6	39·104
1,023	447·5	23·981	1,038	454·1	40·206
1,024	448·0	25·051	1,039	454·5	41·300

This table will be found useful in practice, although it is only approximative, since the difference in density of the various constituents of urine must tell upon the weight of solids in a given quantity of urine.

THE CONSTITUENTS OF THE URINE.

Urea.—To ascertain the presence of urea, the urine should be first tested for albumen, which, if present, should be removed by acidulation with two or three drops of acetic acid, boiling and filtering. Take two or three ounces, evaporate over a water bath, until the fluid has the consistence of syrup. After the fluid has cooled, nitric acid as free as possible from nitrous acid, is added drop by drop, so long as a precipitate is formed. An excess of nitric acid is desirable. Some of these crystals of nitrate of urea, removed with a glass rod and placed under the microscope, show flat rhombic or hexagonal plates closely united to one another.

The quantity of urea eliminated is said to be increased in most acute diseases. In chronic diseases, especially those accompanied by a cachexia, the amount of urea is below the average. Its amount is increased by a high meat diet.

Uric Acid is a less oxidised stage of urea.

Chlorides.—Test, take a fluid drachm of urine in a test tube, add a drop of nitric acid, and then a few drops of a solution of nitrate of silver; if a trace of chloride be present, a cloudiness only will be given, but if in any quantity, a white precipitate is thrown down which is soluble in caustic ammonia, and reprecipitated by the addition of nitric acid in excess.

The nitric acid is added at first to prevent the precipitation of the phosphates with the chlorides.

A rough comparative idea of the quantity of chlorides present may be made day to day, by always taking the same quantity of urine, acidulating it in a test tube with nitric acid, and adding a solution of nitrate of silver until no further precipitate is formed. The test tube must then be set aside for twenty-four hours, and a note then taken of the proportion of the chloride of silver deposit, for comparison with future observations.

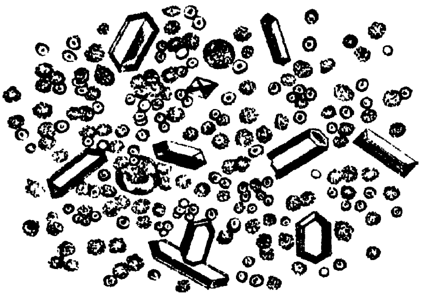
Clinical import.—During acute pneumonia, acute rheumatism, and most other pyrexial diseases, the chlorides diminish in quantity, or even disappear from the urine. Their re-appearance in daily increasing quantity is a sign of the diminution of the intensity of the disease. The amount of chlorides apparently depends upon the digestive powers of the patient even in chronic diseases.

Phosphates and *Sulphates.*—These are not of so much importance, the former are found in greater quantities in diseases of the nervous centres of the bones, after great mental application, and in acute febrile diseases, they are said to diminish or disappear after the acme of the paroxysm of ague. The quantity of sulphates is increased by a full animal diet.

Urinary Sediments.—About four or five ounces of the urine to be examined should be set aside for a few hours in a tall cylindrical glass and allowed to deposit. When the sediment has collected, the supernatant liquid should be poured off. The most likely portion to find renal casts in, is the last few drops. The sediments have been divided into the *organized* such as pus, blood, mucus, epithelium, renal casts, and spermatoza; and *unorganized* as uric acid, urates, oxilate of lime, phosphates, tyrosin, leucin, and cystine.

Organized. *(a) Pus.* Vide Figure 5.—If the urine has been long passed the pus corpuscles undergo changes and cannot be recognised. Urine containing pus readily becomes alkaline. If there is an excess of albumen, renal casts should always be looked for. Pus occurs in the urine in cases of gonorrhœa or gleet, pyelitis from any cause, cystitis, any abscess bursting into any part of the urinary tract, and in leucorrhœa in women.

FIG. 5.



Blood, pus, and crystals of triple phosphate from the urine.—'BEALE.'

(*b*). *Blood.* Vide Figure 5.—It may come from any part of the urinary or renal tract, if from the kidneys it is diffused through the urine and gives it a peculiar smoky appearance. The quantity of albumen is often great even enough to solidify the urine on heating, if there is blood in the urine, it easily becomes alkaline, if it is there, it is necessary to acidulate with acetic acid before testing for albumen. Blood is found in the urine in cases of acute Bright's disease, congestion, cancer, or injury of the kidneys, when there is a calculus in the pelvis of the kidney, or in the ureter, or owing to a parasite, as the *Bilharzia hœmatobia.* In cases of calculus in the bladder, cancerous or villous growths, congestion or ulceration of the mucous membrane. In injuries to the mucous membrane of the urethra, or in inflammation of it as in gonorrhœa; in women it is sometimes due to uterine discharges, as menstruation. If the amount of blood is large, it probably comes from the pelvis of the kidney, ureter, or the bladder; it is commonly said, that if the blood be completely mixed with the urine, the hæmorrhage is from the kidneys; if the urine first passed be clear, and at the end of micturition become bloody or even pure blood be passed, the hæmorrhage is from the bladder or prostate; while, if the first portion of the urine be bloody, and the last drops clear, the hæmorrhage is from the urethra. These rules will, however, often be found to fail.

FIG. 6.

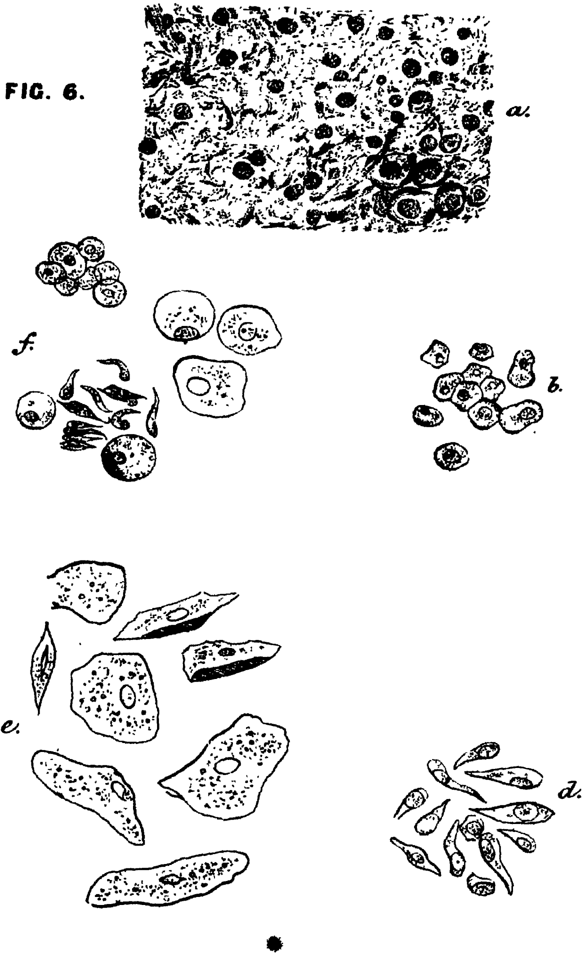
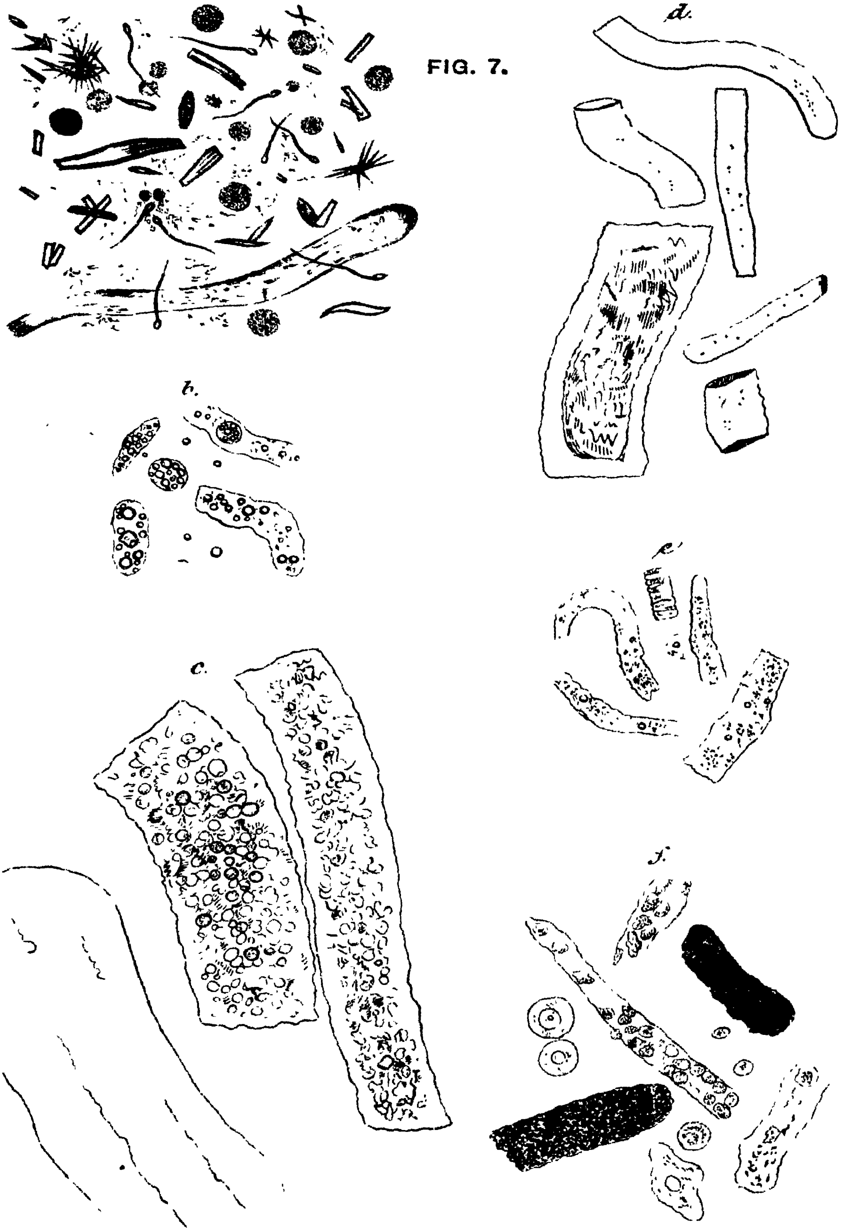


Fig. 6—a, Mucus, in the lower part right hand side several cells of bladder epithelium are represented, b, epithelium from pelvis of kidney, c, from ureter, d, from urethera, e, from vagina, f, from different parts of bladder.—'BEALE.'

(c). *Mucus and Epithelium.*—These are found in every urine. From the urethra and bladder, a roundish or oval cell is seen; from the vagina, squamous epithelium like that of the mouth; from the mucous membrane of the pelvis and ureter under irritation, candate, spindle-shaped, and irregular cells are produced like those once considered diagnostic of cancer.

FIG. 7.



(a). Spermatozoa and Crystals of phosphate of lime × 215.
(b) (c) (d) (e) (f). Renal casts, see next page.

(*d*) *Renal Casts.* Fig. 7.—(*b*) Casts containing oil globules, and free fat cells, × 215. (*c*) Large casts, some containing many cells, others consisting of a perfectly transparent wax-like material, × 215. (*d*) Waxy casts, large and small, × 215. (*e*) Small granular casts, × 215. (*f*) Epithelial casts, some containing cells and some granular matter, × 215.—'BEALE.'

These casts consist of exudations which have taken place in the uriniferous tubes and have been carried down in the urine. The foreign material may take the shape—especially in the case of serum or blood which coagulates—of the tube, and being washed out may appear as a "cast" or mould of the tube. The composition of the cast may vary, it may entangle any substances present in the uriniferous tubes, such as epithelial cells, blood discs, crystals, fat cells, &c., or it may be a perfectly transparent mould, supposing it to be simply coagulated serosity. The casts will vary in size according to the size of the uriniferous tubes they come from. Supposing the lining of the tubes to be increased in thickness the "casts" will be *small*, supposing the tubes to be deprived of their epithelial lining the "casts" will be *large*. As the changes in the uriniferous tubes in different parts of the kidney cannot be the same in extent, the size and nature of the casts will vary somewhat; therefore we must be guided by the general characters of the casts present in any particular case.

"*Epithelial casts*" are small, about $\times\frac{1}{700}$ of an inch in diameter, they are moulds of the uriniferous tubes due to a certain amount of exudation, in which the shed epithelial cells are entangled, they are seen in the early stages of acute nephritis.

"*Granular casts.*"—in these the epithelium is broken down into debris, it is characteristic of the chronic stages of desquamative nephritis.

"*Waxy or hyaline casts.*"—These are large, $\frac{1}{500}$ of an inch, or small $\frac{1}{1000}$ of an inch, they are transparent, hyaloid and glistening, they may be slightly granular. They indicate when small, that the epithelial lining is still present in the kidney tubes, and when large, that it is lost.

But all waxy casts indicate serious disease of the secretory structure of the kidney. The name *oily casts* is given to fibrinous casts enclosing oil. Fatty changes in the kidney may also be indicated by the presence of epithelial cells loaded with fat globules, always a serious condition.

(*e.*) *Spermatozoa,* vide Fig. 7. *a.*—Are present in the urine of men after an emission of semen has taken place, they are sometimes found in perfectly healthy men who are continent.

Fungi and Bacteria are found in most urines after the ammonical decomposition has begun, or is about to begin. Bacteria known as *vibriones, monas crepusculum, microzyma.* Fungi as the *penicilium glaucum* (mildew) *torula cerevisiæ* (yeast). *Sarcinæ* Fig. 16 are sometimes seen.

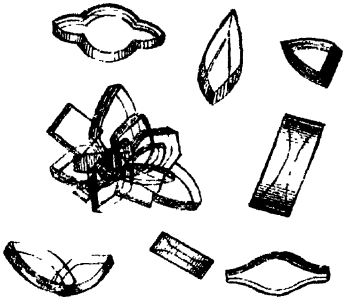
Kiestein is a whitish pellicle formed on the surface of the urine of pregnant women when it is allowed to remain at rest for a few days. It appears to consist chiefly of the mildew fungus, globules of fat, and crystals of phosphates. It is not an absolute sign of pregnancy as it is sometimes found in the urine of men, and is not always present in the urine of pregnant women.

Chylous urine.—This is an affection occasionally seen in this country. The urine passed is turbid and quickly coagulates after being passed, the disease is generally intermittent, and is considered to be due to the presence of the *filaria sanguinis hominis* vide Fig. 14, which should always be looked for both in the urine and in the blood. The albuminoid substance which is found in such urines is of totally different nature from the albumen of the serum according to Eggel.

Unorganised. (*a.*) *Uric Acid.*—This is generally found in any acid urine, accompanied by urates. It is somewhat like powdered cayenne pepper or reddish brown brick dust, its crystalline forms are very numerous.

Clinical import.—The only thing that can be said when it is present, is, that the urine is very acid, it may be that a deposit is taking place in the pelvis of the kidney or in the bladder and a calculus forming.

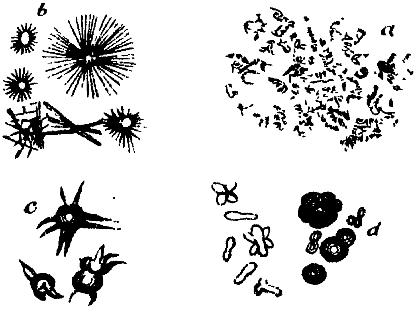
FIG. 8.



Uric Acid Crystals.—'ROBERTS.'

(*b.*) *Urates.*—The most common and least important of all, they are formed of uric acid combined with soda, ammonia, and lime, the first is the most frequent, they are found in most febrile states, or when there has been great perspiration and diminution of the relative quantity of water in the urine.

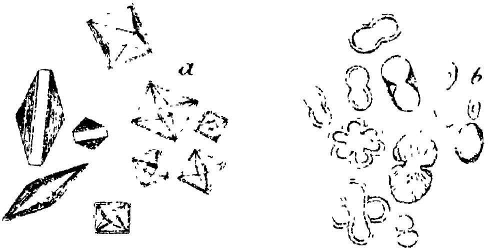
FIG 9.



Urates—'ROBERTS'

(*c.*) *Oxalate of lime.*—This is the most common unorganised deposit after urates, it is often seen in the urine of patients convalescent from acute diseases. It is said by some writers to be present whenever there is diminished oxidation. This sediment is said to be associated with a dyspeptic and hypochondrical condition, sometimes termed the "oxalic acid diathesis." The mulberry calculus is formed of oxalate of lime.

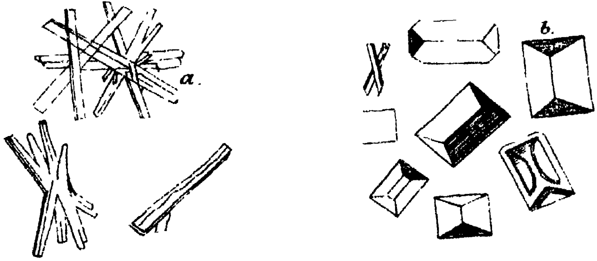
FIG. 10.



Oxalate of lime Crystals—' ROBERTS.'

(*d.*) *Phosphates.*—Always deposited when the urine undergoes alkaline fermentation. Sometimes they are deposited in feebly acid urine. This deposit simply indicates an alkaline reaction of the urine, a condition favourable to the formation of phosphatic calculus.

FIG. 11.



Stellar phosphates and triple phosphates—' ROBERTS' (*e.*) *Leucine and Tyrosin.*—These are rare deposits in the urine. Under the microscope leucin appears in dark globular forms which have been compared to masses of fat cells, tyrosin, however, crystallizes in beautiful bundles of delicate needles, sometimes arranged in a stellate form.

These bodies have been detected in the urine in cases of acute yellow atrophy of the liver, small-pox, enteric fever, and acute tuberculosis.

If these bodies do not occur as a sediment they may be looked for by the following method. A large quantity of the urine must have a solution of acetate of lead added to it so long as a precipitate forms. Through the filtrate sulphuretted hydrogen is passed to remove the excess of lead; the fluid is filtered again, evaporated over a water bath to a syrup, and then extracted with spirit. The leucine is dissolved in the spirit while the tyrosin for the greater part remains undissolved. The part insoluble in spirit may now be dissolved in water and boiled with a few drops of nitrate of mercury; if tyrosin be present, the fluid becomes rose red, and soon afterwards a red precipitate is thrown down. This test for tyrosin is called Hoffman's, and is said to be very delicate. The solution in spirit contains the impure leucine and requires further preparation. It must again be filtered, evaporated to dryness, and dissolved in ammonia, and then acetate of lead added so long as a precipitate forms, then filtered and washed with a little water. The precipitate on the filter, which is a combination of leucine with lead, is suspended in water and sulphuretted hydrogen passed through, the liquid, again filtered, evaporated, and set aside to crystallize. The crystals that form must be tested in the following manner. They are carefully heated with nitric acid in a platinum crucible: if leucine be present, a colourless almost invisible residue is left, which, warmed with a few drops of soda solution becomes of a yellow colour passing into brown. Another test is this, if leucine be heated in a dry test tube, oily drops are formed which give off the smell of amylamin.

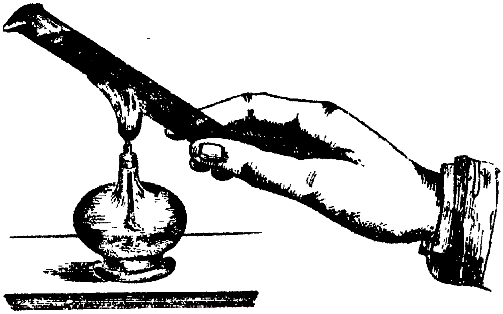
This preparation is undoubtedly very long and troublesome, but without it, it is impossible to speak with confidence of the presence of leucine and tyrosin. Of course, if a sediment suspected to be either of them be found in the urine it may be tested at once by the tests given above. But the recognition of crystals under the microscope having the same form as leucine and tyrosin is of no value, as in many cases, whether in health or disease, urine will give crystals identical in form with them but in which the chemical tests altogether fail.

(*f.*) *Cystine.*—Occurring in regular colourless hexagonal plates united by their flat surface, and overlapping one another, it is sometimes found as a deposit in urine, its clinical import is unknown.

Foreign bodies.—The following bodies are constantly found mixed with the deposits of urine, and the student should be able to recognize them all under the microscope, fragments of human hair, wood, wool, and cotton fibres are often mistaken for renal casts; fragments of tea leaves, portions of feathers, starch, and free oil globules are seen.

Tests for Albumen.—Fill a test tube about two-thirds full of urine and boil the upper layer of the fluid over the flame of a spirit lamp, the lower end of the tube being held between the thumb and the forefinger. Compare the boiled stratum with the cool layer in the lower part by holding the test tube against the light. If there is any cloudiness, allow a drop or two of dilute nitric acid to flow gently down the side of the tube into the urine, the cloud will be permanent if due to albumen, but disappears immediately if due to the earthy phosphates.

FIG. I



Mode of holding the test tube when boiling urine after Wickham Legg.

Cautions.—Do not use too much nitric acid; if the urine is turbid from the presence of urates, clear it by the application of slight heat; if the reaction of the urine is either neutral or alkaline the albumen will not be precipitated by heat, acidulate it by the addition of a few drops of dilute acetic acid; if the urine is very turbid, it may be necessary to filter it.

Rough estimation of albumen.—Half fill and boil the contents of a test tube, treat with nitric acid as above, and allow it to stand for twenty-four hours. Record the quantity as a trace, one-sixth, one-fourth, and so on, as the case may be. If urates are present, the urine must be filtered before boiling as on cooling they will deposit and lead to error.

Remember that albumen may be due to pus or blood in the urine from any part of the genito-urinary tract.

Clinical Import.—Albumen passes from the blood into the urine when the blood-pressure within the renal vein is increased, whether from inflammation of the kidneys (which is the commonest of all the causes of albuminuria and gives rise to the phenomenon in its most fully developed form), or as the result of chronic degenerative changes in the kidneys, diseases of the circulatory, and sometimes also of the respiratory apparatus, when they produce engorgement of all the systemic veins, and among them of the renal veins; or albumen is one of the signs of extravisated blood, or of pus, which may be mingled with the urine at any part of the urinary tract, or finally, it may proceed from other secretions which may have gained admission to the urine accidentally, as from leucorrhœal discharges, or from semen.

Albumen is also observed altogether apart from any inflammatory condition of the kidneys, in catarrhs, and other severer affections of the urinary tract at any part from the pelvis of the kidneys to the external orifice of the urethral canal; the presence of the albumen is then due to the admixture of the pus, the corpuscles and serum of the blood. In these cases albumen is detected also in the filtered urine; generally, however, the urine is less albuminous than that discharged in pronounced renal disease. Finally a moderate degree of albuminuria occasionally appears, but remains only a short time, in a great many severe acute and chronic diseases, in such affections the urine unlike that passed in nephritis or chronic degenerative changes in the kidneys, shows no renal casts, &c., under the microscope. (GUTTMANN).*

DIABETIC CHART.

Name *Age* *Occupation*
Race and Caste *Date of admission*

Date.	Quantity of urine passed, in ounces.	Reaction.	Specific gravity.	Estimated quantity of sugar in grains.	Diet.	Treatment.	Weight of patient in pounds once a week.	REMARKS.

Urine of specific gravity 1,020 is calculated to hold 402 grains of solids to each pint, for every degree above 1,020 add 18¼ grains.

Roberts has found that, after fermentation, "the number of degrees of 'density lost' indicates as many grains of sugar per fluid ounce."

Tests for Sugar.—If the specific gravity is above 1,030, sugar should be looked for—

Moore's Test is a rough but useful one. Equal parts of urine and liquor potassæ or liquor soda are poured into a test tube and the upper layer is heated to boiling as in testing for albumen (see tests for albumen). The heated portion becomes brown red, dark brown, or black according to the quantity present. There is also a peculiar smell of burnt sugar.

Cautions.—1st, If the urine is high coloured, contains an excess of phosphates, or is albuminous, the colour becomes darker on boiling with caustic alkalies. If the urine is albuminous, it must be boiled and the coagulated albumen removed by filtration; care must be taken that the liquor potassæ is free from lead which it takes up from white glass bottles if kept in them; if the urine contains sulphur, a black sulphide of lead is formed on boiling.

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* Hand-book of Physical Diagnosis, N. S. S.

Copper tests.—TROMMER'S, about a drachm of the suspected urine is poured into a test tube, and liquor potassæ or liquor soda added in about the same quantity, a weak solution of sulphate of copper (10 grains to the ounce) is dropped into the mixture; the precipitate which first forms is redissolved on shaking the test tube, the copper solution should be carefully added, shaking the test tube after each drop has fallen into the mixture as long as the precipitate is easily redissolved when the solution will have acquired a beautiful blue or green colour, but should be quite clear and free from any precipitate; the contents of the test tube must be next heated to boiling, when, if sugar be present, an orange red precipitate is first thrown down, which after some time becomes reddish brown. The precipitate consists of the suboxide of copper.

Cautions.—The liquor potassæ should be from 20 to 30 per cent. of strength, not the weak pharmaceutical liquor.

Too much copper must not be added; always use a slight excess of potash; never operate save with a clear solution.

Fehling's Test.—Keep the following solutions in a cool dark place made up in stoppered bottles covered with blue paper. No. 1, Dissolve 665½ grains of crystallized potassio-tartrate of soda in five fluid ounces of a solution of caustic potash sp. gr. 1·12. No. 2, Dissolve 133½ grains of sulphate of copper in ten fluid drachms of distilled water. When wanted for use, add a fluid drachm of the sulphate of copper solution (No. 2) to half a fluid ounce of the alkaline solution (No. 1).

Take about two drachms of the mixed solution and boil in a test tube, if no precipitate forms, it is all right, but if a red precipitate is thrown down, it is useless; boil again, and while the solution is boiling, add the urine drop by drop and watch the effect. A few drops of urine which contains much sugar will at once give a precipitate of yellow or red suboxide; but if no precipitate occur, the urine should still be added to the fluid, drop by drop, any deposit being carefully looked for, until a quantity equal to that of the solution employed has been added. If no precipitate form after setting the test tube aside for an hour, the urine may be considered free from sugar.

Cautions.—Always boil the test solution to prove it; the quantity of urine must never exceed that of the solution; do not continue boiling the urine at a high temperature.

Fermentation Test.—A few grains of yeast are put into a test tube, which must then be filled with urine, and inverted in a shallow dish containing a little of the urine and set aside in a warm place. Fill a similar test tube with water and place under the same conditions. If sugar is present in the urine, the formation of the carbonic acid gas will have driven all the urine out of the test tube.

According to Brücke, healthy urine contains sugar in about ·01 per cent.

Clinical Import.—If the foregoing test announce the presence of sugar, in considerable quantity, as often as the urine is examined, (for when sugar is found, the urine should be examined daily for some time) diabetes mellitus may be inferred to exist. But should the presence of sugar be variable, and its amount small, the fact is not of any known great diagnostic, or therapeutic importance. Sugar is said to be present in the urine of the fœtus, of women when suckling, and of some old persons; it is seen in the urine during convalescence from some acute disorders, especially cholera, in malarious diseases, and in carbuncle. Certain injuries of the nervous system also bring on glycosuria.

Diabetes Insipidus, is characterised by the passing of a large quantity of clear, colourless urine, of low specific gravity (1003 to 1007) devoid of sugar and albumen. The complaint is usually attended with thirst, harsh skin, and feebleness of body and mind.

Tests for Bile.—There is a permanent froth on shaking, the colour of urine is dark greenish brown. White filtering paper dipped in it is coloured yellow when bile is present.

Test for bile Pigments.—Allow a drop of nitric acid and of the urine to be examined to run together on a porcelain dish, when if the bile pigments be present, a zone of colour will form at the point of contact, first green, then violet, blue, and red, representing the various stages of oxidation of the colouring matters. The most characteristic is green, without it the presence of bile pigments cannot be predicated.

Caution.—Any urine which contains a large quantity of indican will give a blue, or violet, and even green colour with nitric acid. The green colour is however rarely seen with any other substance than bile pigments.

Tests for the bile Acids.—HOPE'S. The urine must be rendered faintly ammonical with caustic ammonia, and then diacetate of lead added, as long as a precipitate occurs. The precipitate must be collected on a filter, and washed with distilled water, then boiled with alcohol over a water bath, and filtered while hot, to the filtrate a few drops of potash or soda are to be added, and the solution evaporated to dryness over a water bath. The residue is again to be boiled with absolute alcohol over a water bath until a little be left, this must then be thrown into a great excess of æther in a stoppered bottle, and after some time, the alkaline salts of the bile will crystallize out. In order to prove that these crystals are salts of the bile acids, they must be dissolved in a little distilled water, and tested after the method of Pettenkofer as follows :

Dissolve some of the crystals in distilled water in a test tube, and add sulphuric acid at first in small quantities to precipitate the bile acids, but afterwards in amount sufficient to redissolve them which renders the mixture perceptibly hot to the hand. A drop of syrup may now be let fall into the liquid, which then shows a play of colours passing from pink to cherry-red, and from red to purple.

Pettenkofer's test should never be applied directly to urine; the bile acids are never present in sufficient quantity to give the reaction, however modified, and the urine in jaundice frequently contains a small quantity of albumen which gives a reddish violet reaction with sugar and sulphuric acid, while the action of the acid upon other constituents of the urine renders it impossible to be sure of the distinctive colours of Pettenkofer's test.

SALAR JUNG

CHAPTER XX.

ON THE EXAMINATION OF THE EXCRETA, CONTINUED.

The Evacuations in Dysentery and Hepatic Abscess.

The late Professor Parkes gives the following description of the alvine evacuations in dysentery and hepatic abscess.*

In dysentery the stools are first simply numerous, perhaps feculent, in a few very rare instances scybalous.

The stools in simple acute, and in hepatic dysentery, vary as follows:—

Glandular enlargement and commencing ulceration.—Slimy and mucus, with bloody streaks, sometimes in masses, sometimes like the albumen of an unboiled egg.

Glandular enlargement.—Yielding slime and fæces, stools often numerous, sometimes dark-coloured and frothy, sometimes yellow, sometimes like bran suspended in a fluid. Causes of these differences not known.

Complete Ulceration.—Stools slimy, gelatinous, lymphy, bloody, watery, muddy, or partly liquid, partly solid, like washings of meat, or chocolate-coloured, or resembling treacle and water.

Irritable Ulcer.—Florid blood in streaks, with a reddish mucus. The stools often resemble brick-dust.

Scorbutic Ulcer.—Dark bloody offensive serum, mixed with fœtid, grumous, chocolate-colored secretion.

Healthy Ulcer.—Lymphy masses with no blood or a few florid streaks, mixed with a clear or slightly turbid fluid. Stools small in quantity; feculence gradually added; sometimes stools granular.

Sloughing Ulcer.—Dark-colored, sanious, and offensive discharges, generally mixed with albuminous and gelatinous masses, and, if the rectum be principally affected, sometimes with dark, soft, and unnatural-looking feculent stools. If the whole of the colon be affected, stools often nearly pure dark, perhaps clotted blood, broken down into a muddy fluid.

With primary universal Hepatic Abscess.—Often nearly pure blood, with a little mucus and slime.

With primary partial Hepatic Abscess.—Always much blood, but also mixed with dark slimy mucus, perhaps frothy and variegated, with yellow, apparently feculent, streaks. (This yellow substance seems in this case to be secreted by the glands in the duodenum, or by the pancreas.)

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* Remarks on the Dysentery and Hepatitis of India, 1846.

With Secondary Hepatic Abscess.—Frothy, beaten up, yellow or brown, yeasty, little solid part, giving sometimes a burning sensation when passed; not numerous.

Subacute and Chronic Dysentery.—Stools variegated, green, yellow, brown, grey, slimy, clayey, fatty, gelatinous, often like lymph partially dissolved in bloody serum. Many other appearances too numerous to be detailed.

Rare form of dysentery attended by general mucus inflammation; glands enlarged, but ulceration much less rapid than in other forms; sometimes complicated with gastroenteritis. Stools numerous, liquid, yellow, sandy-coloured; at a late period dark, frothy, somewhat beaten up, inodorous for some days after attack. The stools are something like those seen in latent hepatic abscess, but can always be distinguished.

CHAPTER XXI.

ON THE EXAMINATION OF THE EXCRETA, CONTINUED.

The Evacuations in Enteric Fever, and Cholera.

Enteric fever.—The bowels may be confined all through the attack.

The stools may be normal all through the attack.

There may be constipation with occasional passage of scybala; violent hæmorrhage from intestinal ulcers has been known in such cases.

There may be slight feculent diarrhœa throughout.

The characteristic motions vary very much during the first week there may be only slight feculent diarrhœa, probably an eliminative discharge from the liver and intestinal glands.

During the second and third weeks the diarrhœa is usually a sign of ulceration of Peyer's glands and of inflammatory irritation of the surrounding mucous membrane. The number of stools may vary from one in the twenty-four hours to twenty, or more, generally from three to six.

They are thin, yellowish, pultaceous, and somewhat resemble badly made pea soup in which the meal is not thoroughly cooked or mixed and sinks to the bottom, their odour is fœtid and characteristic according to Trousseau. They separate on standing into an upper watery layer of a yellowish greenish, or brown colour. According to Parkes,* this liquid has a specific gravity of 1,015 and contains about forty parts per 1,000 of solid matter, consisting chiefly of *albumen*, and soluble salts, particularly chloride of sodium, and a lower layer or deposit consisting of the remains of food, epithelium, mucus, blood corpuscles, small yellowish flocculi, shreds of slough, and crystals of triple-phosphates. These triple-phosphates have been pointed out as being common to all diseases, where, as in enteric fever, the stools have a marked tendency to decomposition. Immediately after the stools are passed, they have a neutral or acid reaction instead of being alkaline, which they soon become on standing.

Doctor Harley† points out that the discovery of a fragment of a disintegrated Peyer's gland in the stools is pathagnomonic of the disease. He says if the flocculent debris when examined under water by the aid of a pocket lens, presents a number of minute, closely placed follicular depressions with minute circular orifices, loosely embedded in a ragged fibrous stroma, we have direct and positive evidence of the nature and progress of the disease. To apply the test the stools should be strained through a little cap-net, the matters arrested thereby should then be washed, floated on clear water, and examined with a common pocket lens. Murchinson‡ says the characteristic stools are best seen after the tenth day and that sloughs are rarely found till after the fourteenth day.

In some cases the stools instead of being watery, are pultaceous, frothy as if fermenting, and so light as to float on water.

At other times they are like mud, or bird lime, or they may contain blood from a few drops to several pints.

Dr. Hudson§ has seen the evacuations consisting entirely of a green fluid evidently containing the colouring matter of blood which had undergone a change, occasionally the stools are mucus mixed with blood, resembling those of dysentery.

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* Medical Times, June 1850, page 396.

† A System of Medicine, by Reynolds, Vol. I.

‡ Treatise on Continued Fevers, 1873.

§ The Study of Fever, 1867.

If salts of bismuth, lead, silver, or copper have been administered, the stools may have a dark greenish-brown, or black colour.

Undigested milk in the stools is often deceptive.

Diarrhœa continuing after the fever has left is often a sign of unhealed ulcers.

The return of diarrhœa during convalescence is generally caused by irritation, or by a new attack of ulceration.

Trousseau* points out that there is a form of diarrhœa during convalescence after an attack of enteric fever, generally occurring in persons who have been underfed during the progress of the case, accompanied with much irritability of the stomach and frequent alvine evacuations of mucus and bilious matter, of a colour successively varying from yellow to apple-green, bottle green, or sometimes blue, which he considers depends on disorders of the function of secretion and is best treated with solid food.

Chronic diarrhœa and death from malnutrition is one of the sequelæ of enteric fever.

Harley says the patient is not convalescent until the stools are solid.

Hæmorrhage may occur at any time after diarrhœa has appeared and as long as it continues, it may appear even where there is constipation. Hæmorrhage generally takes place in the third or fourth week. It may depend upon (*a*) ulceration involving a large vessel, (*b*) congestion of the venous capillaries, (*c*) a septic condition of the blood. It may appear in the stools from a few drops to pints, but it should always be remembered if other symptoms point to hæmorrhage that it may be retained within the intestinal canal.

The Evacuations in Cholera.—The evacuations in choleraic diarrhœa are more or less feculent, but very liquid, and generally copious, the colour varies from brown to light yellow or straw, and when the disease passes into cholera, the motions are increased and assume the rice-water character.

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* (Clinical Lectures, Vol. II, page 385, N. S. S.)

In cholera there may be no evacuations at all, or they may be retained in the intestinal canal.

They are generally copious and fluid, during the stage of evacuation, the first stools generally consist of the ordinary contents of the intestine mixed with much liquid, pints or even quarts may be passed, they soon become of a light straw, or pale drab colour. The name of *rice-water* stool has been given to the genuine unmixed cholera evacuation, and if collected separately after the first two or three have been passed, the discharges do resemble water in which rice has been boiled. The fluid is thin, pale, slightly opaque, or slightly turbid depositing a sediment on standing which is like fine, minute, flaky particles of rice broken down on boiling. Occasionally in the evacuation stage, the fluid is whitish or somewhat milky, or of shades varying between this and the pale drab colour before mentioned. The vomited matter if unmixed with ingesta is clear and watery.

The appearance of blood in the stools is a very unfavourable sign.

In the stage of collapse the evacuations from the stomach and bowels are less frequent and copious. The alvine discharges contain less liquid, sometimes merely a little clear fluid with gelatinous mucus-like flakes or masses. In the stage of reaction they become milky or whitish, then greyish, then darker or muddy and at last brown.

The cholera stool separates on standing into a thin whey-like fluid, and a variable quantity of sediment. The specific gravity of the liquid portion is 1,005 to 1,010. The sedimentary flakes and particles contain organic forms, lying in a hyaline base, which are described as follows:

Amorphous granular matter and larger granules, often very abundant.

Minute bodies having the general character of nuclei, $\frac{1}{250}$ to $\frac{1}{180}$ of a line in diameter.

Fine granular cells; some large resembling pus cells.

A very small quantity of scaly epithelium, generally not easily discovered. Bacteria and a number of different fungi none of which are characteristic. If the evacuations removed from the intestines after death are examined, they are found to contain much epithelium.

The specific gravity of the liquid part is seldom above 1,012 in the height of the stage of discharge. The reaction is faintly alkaline or neutral. Dr. Parkes has shown that the liquid portion is not similar to the serum of the blood; that it contains but little albumen, and consists chiefly of the water of the blood, with saline matter, and a small quantity of animal matter. The quantity of albumen and animal matter found in the stools is very small, the quantity of salts contained is considerable. The greatest quantitative loss which the blood suffers is in its watery element. For every 100 ounces passed in the fluid evacuation stage, the loss to the blood is, in water 98 to 99 ounces, and of salts nearly or about one ounce. The stools amount to from 80 to 150 ounces during the evacuation stage.

The salts exuded are the chlorides of sodium and potassium, phosphate of soda, carbonate and sulphate of soda, bearing a proportion of seven or eight parts in a 1,000; a proportion nearly resembling the quantity in the blood within the vessels. The earthy phosphates do not pass through the mucous membrane as in health. (GOODEVE.)*

CHAPTER XXII.

THE TERMINATIONS OF DISEASE.

In unimpaired constitutions there is always a tendency to a spontaneous favourable termination of disease processes.

Diseases end in the following ways:—

The patient may gradually but completely recover. This process is called *convalescence*. Sometimes the cure is interrupted by a return of the disease,—*relapse*—in which the patient's position is rendered more unfavourable by the debility and unrepaired mischief remaining from the first attack.

He may lose all the more urgent symptoms of his disease, and retain some of the less urgent not recognizable perhaps by himself, but discoverable on a physical examination of the organ.

The constitutional changes may pass away but the local disturbance remain, the disease persists in an altered or *chronic* form.

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* A System of Medicine by Reynolds, Vol. I.

A disease may leave a particular organ, and be transferred to some other part. This is called *metastasis*. The relation of this rare occurrence is not understood.

The disease may become worse and end by the destruction of the patient.

Watson speaks of, the brain, the heart, and the lungs as 'the tripod of life.' Bichat pointed out that death begins in one of these.

Death occurs from the 'decay of life' as in old age, from rapid sinking of the vital powers in disease, or from injuries the result of an untoward accident. Death from extreme old age the 'end of a long and sometimes weary journey' is rare. Death from disease is usually a complex affair. It requires an accurate knowledge of the functions of the heart, lungs, and nervous system, and of their mutual dependence, in order to appreciate any tendency to failure in any of them. To obviate the tendency to death was a doctrine much dwelt upon by Cullen.

The following are the modes in which diseases end fatally.*

'Life can only be maintained by the circulation of arterial blood. If no blood circulates through the arteries, or only venous, the result is death. Death by the cessation of the circulation of blood may be of two kinds (1) Death by *anæmia* in which there is a want of due supply of blood to the heart. The anæmia may be due to the loss of blood, or to its impoverishment and diminution by disease. (2) Death by *asthenia*, where there is a failure in the contractile power of the heart. This may arise from disease of the cardiac walls or valves, or from arrest of the hearts action through the nervous system, as in apoplexy, disease of the medulla oblongata, shock, or by certain poisons. When either from anæmia or asthenia, the death is sudden, it is said to be due to *syncope*. Sometimes life fails partly from anæmia and partly from asthenia; as in cases of starvation, phthisis, dysentery, &c.'

'Death by the circulation of venous blood may happen in one of two ways (1) by *apnœa, asphyxia*, or *suffocation*, where access of air to the lungs is stopped, as in drowning, strangulation, many laryngeal and lung diseases, tetanus, section of the phrenic and intercostal nerves, &c. (2) By *coma* in which the muscular movements required for respiration cease owing to insensibility produced by cerebral disease. In *apnœa* there is successively impeded respiration, circulation of venous blood, and insensibility. In *coma* the order is reversed—insensibility, cessation of thoracic movements, and stoppage of the chemical function of the lungs.

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* Tanner's Index of diseases, 1876.

CHAPTER XXIII.

HINTS ON MAKING POST-MORTEM EXAMINATIONS.

Examinations of the dead are performed earlier in this than in colder countries; as putrefaction sets in so much earlier and destroys or obscures the pathological changes. They should always be conducted with privacy, care, as great cleanliness as possible, and with due regard to the feelings of the relatives of the dead.

In making such examinations the student has to a great extent to free himself from the habits acquired in the dissecting room; most of the incisions will require a free sweep of the hand instead of the usual fine cuts used for dissecting, he should grasp his knife—a good strong one—firmly in his hand. The incisions into the internal organs should be bold, in order to let comparison be made between the different portions.

Note the name, age, sex, caste, date of admission, date and hour of death, date and hour of the examination, condition of the body as regards nutrition, weight, height, deformities and malformations, degree and extent of *rigor mortis*.

In cases sent for *medico-legal** examination the date and hour of the receipt of the body should be entered, careful notes should be made of the state of the clothing, if any cuts in it correspond to wounds on the body, all wounds, external marks and caste marks especially in cases where the body has not been identified, should be noted and compared with any marks mentioned in the Police Report if there is one; any signs of violence, fractures or dislocations should be looked for, noted, and described. Any foreign bodies found in wounds should be carefully preserved; always examine the neck for signs of compression, also the state of the teeth, hair, orifices of the body, state of the pupils, and whether any substances are grasped in the hands.

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* Vide Departmental Circular, No. 4,911 of 15th June 1875.

In all cases accurate notes should be recorded at the time of the examination and copied out afterwards into the register; the original notes should always be kept, and in *medico legal* cases should not be shown to any one unless they are called for in evidence by the judicial authorities.

The following rules are embodied in the Departmental circular before referred to :—

"In making his examination he should disturb, as little as possible, any organ which may communicate with an external wound, if he has reason to think that the body may be re-examined by another medical man." Para. xi.

"In the case of females, he should examine the ovaries or uterus, bearing in mind that abortion is sometimes caused by the introduction into the uterus of pointed instruments which may cause death. He should note the presence or absence of pregnancy, if present, the probable period to which it had advanced, and examine the external generative organs for marks of violence." Para. xii.

"In the case of infants, he should note the condition of the umbilicus and cord, if any of the latter remain. He should also remove the lungs, and try whether they sink or float in water." Para. xiii.

You should always examine the heart to see the state of the inter-auricular opening, and the long bones to note the centres of ossification in order to see the age of child.

"In cases of suspected poisoning, he should not neglect to examine every organ of the body, and should pay special attention to the rules laid down with reference to the Chemical Examiner." Para. xiv.

It is not absolutely necessary in every examination made for clinical purposes that the brain and spinal cord should be examined, but in all cases the changes in the other organs and the state of the muscles and cellular tissue should be noted. All *medico-legal* examinations should be complete, as it is not at all uncommon to find a man who has received a beating die from cerebral hæmorrhage, or a fall cause dislocation of one of the vertebræ, either of which might be easily overlooked if the examination was not complete, and the result as evidence would be rendered most unsatisfactory.

The following hints will be found useful in making these examinations:

SKULL should be exposed for examination by an incision across the vertex from ear to ear, and reflecting the flaps. The calvaria should be removed by a circular cut above the frontal sinuses and ears, to the occipital protuberance. The *dura mater* should be opened by one circular incision, care being taken not to tear it, if adherent, it should be cut away. The brain should be removed from before backwards by severing in succession the various nerves and dividing the tentorium cerebelli. These different structures should be examined and described in turn.

SPINAL CORD should be exposed by dividing the laminæ of the vertebræ after dissecting back the superficial soft structures, the dura mater slit up .and the roots of the nerves severed.

THORAX AND ABDOMINAL CAVITIES should be exposed by a longitudinal incision from the symphysis of the lower jaw to the symphysis pubis through the soft structures of the abdominal walls, and dissecting them back. Always open the abdominal cavity first, examine its contents, and note the position of the diaphragm; it is rarely necessary to make lateral incisions through the abdominal walls. The sternum should be removed by dividing the costal cartilages at their junctions with the ribs, and opening through the sterno-clavicular articulation. Open the pericardium. Note the state of distension of the heart especially the right auricle and ventricle. The organs should all be closely examined *in situ*. If it is necessary to remove them the vena-cavæ should be tied to prevent the blood soiling the place. The viscera in the thorax may now be removed separately, or *en masse*, from the tongue downwards. This may be done by freeing the tongue and, pharynx from their attachments to the bones of the skull and face, making an incision along each side of the neck through all the structures down to the spine, raising each lung separately and carrying on the same incision through the costal pleura, cutting through the inferior vena-cavæ and the attachment of the pericardium. The whole contents can then be withdrawn together. The larger glandular viscera in the abdominal cavity may next be removed separately, and the stomach and intestinal tract down to the rectum in continuity. In cases of suspected poisoning it is safer to remove the stomach separately having previously tied it at both ends. The bladder and external organs of generation may be removed together by cutting through the symphysis pubis.

After removal of all the viscera, the weights and measurements of the various organs should be correctly taken and noted.

The following points should be noted as regards the various organs :—

(*a.*) CALVARIA.—The presence or otherwise of fractures, and their position, adhesions of the *dura mater* to the covering bones, any sign of morbid changes.

(*b.*) MEMBRANES OF BRAIN.—Their character, the condition of the Pacchionian bodies, the quantity of sub-arachnoid fluid,the state of the meningeal arteries and of the venous sinuses.

(*c.*) CEREBRUM AND CEREBELLUM.—Appearance, and consistence of the convolutions ; the relative proportions of the grey and white matter ; color of cut surface ; appearance of puncta vasculosa. The state of the pons and medulla oblongata ; extravasation of blood its position and quantity ; tubercular deposit, or other adventitious growths ; state of ventricles.

(*d.*) SPINAL CORD.—The state of the enclosing membranes, the size and consistence of cord, any changes in either.

(*e.*) RESPIRATORY SYSTEM.—*Larynx, trachea,* and *bronchial tubes.* The presence and degree of hyperæmia of the mucous membrane, the presence of membranous formations, or of ulceration, typhoid, varioloid, tubercular, or syphilitic ; the presence of any new growth ; the degree of œdema ; the dilatation or constriction of the bronchi, and any thickening or thinning of the bronchial walls.

The *Lungs.*—Whether emphysema exists ; the degree of hyperæmia, congestion, or œdema ; the presence of hæmorragic infarcts, inflammatory consolidation, gangrene, tubercle, or cancer.

The *Pleuræ.*—Presence and degree of inflammation, the character and amount of effused products ; the presence of air, tubercle, or cancer.

CIRCULATORY SYSTEM .—The *heart.* Amount and character of the blood. Hypertrophy, dilatation, atrophy, the presence of pericardial or endocardial inflammation; the changes in the valves, the degree and character of the degeneration affecting the muscular structure; the presence of fibrinous deposits in the cardiac cavities or in the large vessels.

The *Vessels*.—Their state of dilatation, the condition of their tunics, the presence of atheroma, or of ulcers; the presence of thrombi or emboli.

DIGESTIVE SYSTEM.—*Mouth*. The tongue, its size, form, and the state of the papillæ; note the state of the fauces, tonsils, and pharynx, and the presence of inflammation, or of ulceration.

Stomach.—Note its contents; the degree of inflammation and erosion of the mucous membrane if present; the state of the glands; the presence of ulcers, carcinoma, atrophy, or dilitation. Note the state of the duodenum, and of the entrance of the gall duct.

The *Omentum and intestinal Canal*.—Note the contents of both the small and large intestines, the state of the glands in their mucous membrane,* the degree of inflammation if present; ulceration, whether scrofulous, dysenteric, or enteric; carcinoma, presence of cicatrices, the state of the rectum and anus, the mesentery, with its lymphatic glands and vessels.

The *Liver*.—The weight, the state of congestion, the presence of suppuration, cirrhosis, gummatous tumours, cicatrices, degenerations whether fatty or lardaceous, hydatid cysts, carcinoma, the contents of the gall-bladder and ducts; the state of the hepato-duodenal ligaments and vena-porta.

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* Anatomical form of glands which compose the substance of the mucous membrane of the alimentary canal.

I. Vesicular, and lenticular, or pimple-like glands.—Usually closed. (*a.*) solitary *e.g.*, in the palate, buccal membrane, œsophagus and stomach; also found deeply embedded in the great gut, and scattered more near the surface of the small gut. (*b*). Clustered in groups—*e.g.*, Peyer's patches of glands in the ileum.

II. Follicular open glands or crypts.—A transient condition of the vesicular glands, after rupture and discharge of their contents—*e.g.*, great gut and stomach.

III. Tubular glands occur in the small and large intestines, as the so-called follicles of Lieberkühn; and in the stomach, as the stomach tubes.

IV. Racemose glands.—Consisting of tubes with simple sacks or vesicles, in clusters round a stalk or duct—*e. g.*, the cardiac œsophageal glands, and the duodenal gland of Brünner.—*Aitkin's Science and Practice of Medicine*, Vol. I.

The *spleen.*—Its state of enlargement or hypertrophy; its melanotic condition; the presence of embolic infarctions; amyloid degeneration; fibroid change; cicatrices.

Examine the pancreas, cœliac axis, semilunar ganglion.

Examine the retro-peritoneal lymphatic glands, the receptaculum chyli, the aorta, and the inferior vena-cava.

Examine the state of the spine, the ribs and the pelvis.

Look for any changes in the supra-renal capsules.

GENITO URINARY SYSTEM.—The *kidneys.* Their external characters, the capsule whether adherent or not, the state of the surface of the secreting structure, if lobulated, smooth, granular, or bloodless, the relative proportion of the cortical and pyramidal structures, the pelvis, the ureters, whether dilated; the contents and thickness of the walls of the urinary bladder, the state of the urethra. Note the state of the prostate gland, vesiculæ seminales, the testicles, spermatic cord, and penis in the male; the vagina, uterus, Fallopian tubes, ovaries, and perametria in the female.

The following solution should be kept ready in the dead house in order to test the tissues for amyloid degeneration—*twelve grains of iodine* to be dissolved with *twenty-four grains of iodide of potassium, in three ounces of water.* If this solution be applied to the cut surface of an organ which has undergone this form of degeneration the affected portions will change to a deep *reddish brown* colour. It may be necessary to make thin sections with a Valentin's knife, having done so, wash all the blood away, apply the iodine solution and examine the specimen under the microscope.

AVERAGE WEIGHT AND MEASUREMENTS OF HEALTHY ORGANS IN EUROPEANS. (GRAY).

Brain.—Weight, male 49½, female 44 oz.

Spinal Cord.—Weight about 1½ oz. Length 16 or 17 inches.

Heart.—Weight, male 10 to 12 oz., female 8 to 10 oz. Measurement 5 inches long, 3½ inches broad in broadest part, 2½ inches thick.

Lungs.—Weight, right 23 oz., left 19 oz; less in female. Vary much according to amount of blood or serous fluid they may contain.

Liver.—Weight 3 to 4 lb. Measurement 10 to 12 inches transverse, 6 to 7 inches antero-posterior, 3 inches thick at back part of right lobe.

Pancreas.—3 oz.

Spleen.—Weight 7 oz. Measurement, adult 5 inches long, 3 or 4 inches broad, 1½ inches thick. Size and weight vary according to individual, age, and condition; decreased in old age, increased during and after digestion; large in highly fed, small in starved animals.

Kidneys.—Weight, male 4½ to 6 oz., female 4 to 5½ oz. Left heavier than right by about 2 drachms. Measurement 4 inches long, 2 inches broad, 1 inch thick. Supra-renal capsules 1 to 2 drachms.

Testes.—6 to 8 drachms.

Uterus.—1 to 1½ oz.

WEIGHT OF BODY.

The following table shows normal weight in proportion to height in Europeans :

Exact Stature.		Mean Weight.				Weight increased by 7 per cent.			
Feet.	Inches.	st.	lb.		lb.	st.	lb.		lb.
5	1	8	8	or	120	9	2	or	128
5	2	9	0	or	126	9	9	or	135
5	3	9	7	or	133	10	2	or	142
5	4	9	13	or	139	10	9	or	149
5	5	10	2	or	142	10	12	or	152
5	6	10	5	or	145	11	1	or	155
5	7	10	8	or	148	11	4	or	158
5	8	11	1	or	155	11	12	or	166
5	9	11	8	or	162	12	5	or	173
5	10	12	1	or	169	12	13	or	181
5	11	12	6	or	174	13	4	or	186
6	0	12	10	or	178	13	8	or	190

This reads: a man of 5 feet 8 inches should weigh, in his clothes, 11 st. 1 lb; he may exceed this by 7 per cent. (to 11 st. 12 lb.) without affecting his vital capacity; beyond this amount his respiration becomes diminished. The average weight of the clothes at different ages is 1-18th of total weight of the male body, and 1-24th of that of the female. (QUETELET).

CHAPTER XXIV.

ON THE USE OF THE MICROSCOPE.

As every clinical student should at least understand the use of the microscope as far as it concerns diagnosis, a few words on the subject will be useful.

The difficulties in acquiring the necessary manipulative skill are not so great as is generally supposed, it only requires attention and practice to overcome them.

The instrument supplied to Government Hospitals and Dispensaries is the *compound microscope.* It differs from a simple microscope, inasmuch as the *image* formed by the object glass is further magnified by one or more lenses forming an eye piece; or, in other words, the rays of light from an object being brought into a new focus, there form an image, which image being treated as an original object by the eye piece is magnified in the same way as a simple microscope magnifies the object itself.

Generally speaking there are supplied two eye pieces, a long, and a short one, and two object glasses an inch and a quarter inch.

The long eye piece and the inch object glass magnify from 35 to 50 diameters. The long eye piece and the quarter inch object glass magnify from 200 to 220 diameters. The short eye piece magnifies the *image* formed by the object glass somewhat more than the long one.

Before using a microscope great, care should be taken in cleaning the lenses.

All compound microscopes are made up of the *optical portion* and the *mechanical appliances.* The optical portion includes the *object glass* for magnifying the object, the rays of light from which are brought to a focus within the tube of the instrument; *the eye piece* for magnifying the *image* formed by the object glass; the *mirror* from which the light is reflected so as to pass through the object; the *bulls eye condensor* is used for bringing direct rays of light to bear on opaque objects which cannot be examined by light transmitted by means of the mirror. The mechanical appliances consist of the *adjustments* for altering the focus, of these there are two, the *coarse* and the *fine.* The movements of the *coarse* adjustment is generally by means of a rack and pinion, but in some microscopes it is done by the fingers alone the tube being arranged to slide in another tube; either of these adjustments often require a little oil to make them move freely and with ease; the arrangement of the fine adjustment varies very much in most instruments, it allows of a more delicate motion when high powers are used. The *body*, the tube of the microscope is in many instruments supplied with a second portion which allows of its being elongated, the use of this being that the eye piece still further magnifies the image formed by the object glass in proportion to the length the tube is drawn out. The body of the microscope includes its stand which differs very much in different instruments, it should always be firm and heavy enough not to be easily shaken. Every microscope should be capable of being placed in a vertical, inclined, or horizontal position. The *stage* upon which the object to be examined is to be placed should move easily and be kept very clean, some microscopes are supplied with mechanical arrangements for moving the stage, but it is better for the student to train his fingers to move the glass slide on the stage, most stages are supplied with slips for fixing the glass slide; the *diaphragm* is the circular plate below the stage with holes in it of different sizes to enable the observer to modify the amount of light transmitted, it should move freely; as a rule for clinical work the hole of about the medium size will allow of enough light.

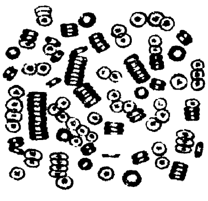
To adjust the Microscope for work.—Choose the eye piece and object glass you wish to work with, the long eye piece and the quarter inch object glass are the most generally useful for clinical work. See that they are clean, screw the object glass into its place at the bottom of the tube, and insert the eye piece in the top. Fix the body of the instrument either vertically or at the angle you wish to work it. You should select a good light to work in, that from a white cloud is the best; reflect the light from the mirror through the opening in the stage so that you can see light through the eye piece; adjust the diaphragm so as to modify the light, place the glass slide in the slips on the stage and with the *coarse* adjustment gradually lower the tube till you focus the object, then use the *fine* adjustment to define the object more clearly; while observing, your right finger and thumb should be constantly on the fine adjustment the least movement of which shows you the object more thoroughly. Take care in lowering the tube with the coarse adjustment that you do not touch the thin glass over the object you are examining, and that you do not allow any moisture to get on the object glass, as either will interfere with your observation.

Before commencing to work, clean your thin glasses and plate glass slides thoroughly.

A single drop of any fluid to be examined should be placed on the slide and the thin glass placed over it, thus, breath on the thin glass to moisten it, then grasp it with a fine forceps or with your finger and thumb and let one of its edges touch the margin of the fluid and allow it to sink slowly on the fluid in order to avoid air bubbles. Remove any superfluous fluid with a piece of blotting paper. The commonest mistakes are to put too much fluid under the glass and to let air bubbles in. It is much better to prepare two or three sides and examine them one after another, this must be done at once as they dry rapidly in hot weather.

Blood.—A drop of blood may be obtained for examination by pricking the finger with a needle, or making a slight scratch on any part of the body, very little is required, it should be placed on the slide in as thin a layer as possible and covered over with a thin glass. Examine with the long eye piece and quarter inch object glass.

FIG. 13.



Blood Corpuscles × 212—'BEALE.'

Coloured Corpuscles are circular discs. $\frac{1}{3000}$ to $\frac{1}{3500}$ in diameter; and $\frac{1}{10000}$ inch in thickness, depressed a little on each side; when seen sideways, biconcave or dumbbell shaped. Of a pale buff colour, but when aggregated of a reddish tint. They have a tendency to run together in rolls or rouleaux. Notice a corpuscle as it rolls over, and observe the change in its form, being alternately circular and biconcave.

The corpuscle has no nucleus, the false appearance of a nucleus is occasioned by the refraction of light in passing through a biconcave disc. Prove this by slowly altering the focus. These corpuscles consist of two parts, a stroma, which is colourless, and the coloured part, a red crystallizable substance *hæmoglobin.*

Colourless Corpuscles.—Their proportion to the coloured varies, during fasting from one to 800 or 1000, after a meal 1 in 300 or 400.—Foster.*

When perfectly fresh they are spherical and faintly granular, they quickly alter and become markedly granular.

About $\frac{1}{2500}$ inch in diameter, nucleated, the nucleus not often apparent without the addition of weak acetic acid. They are nearly always isolated, and do not collect together or mix with the coloured discs. They are endowed with a power of spontaneous motion (amœboid movement) but it requires close watching for some minutes to see these movements even in freshly drawn blood.

Action of reagents on blood.—Water causes the red corpuscles to become smooth and pale, and disappear. Acetic acid does the same, but the colourless corpuscles become more distinct and their nuclei more apparent. Taunic acid causes the hæmoglobin to collect in small lumps at the side of the red corpuscles.

In leucocythæmia, the colourless corpuscles become much increased in quantity, so that, instead of two or three being seen in the field of the microscope at the same time, some thirty, forty, or even more are visible.

Instruments have been invented to enable an observer to count the number of blood corpuscles in a given space under the microscope.

It is sometimes necessary to examine the blood at different hours of the day, for instance, the *filaria sanguinis hominis* is said to be most active towards evening or at night; it often requires long and repeated examinations of the blood before it is found.

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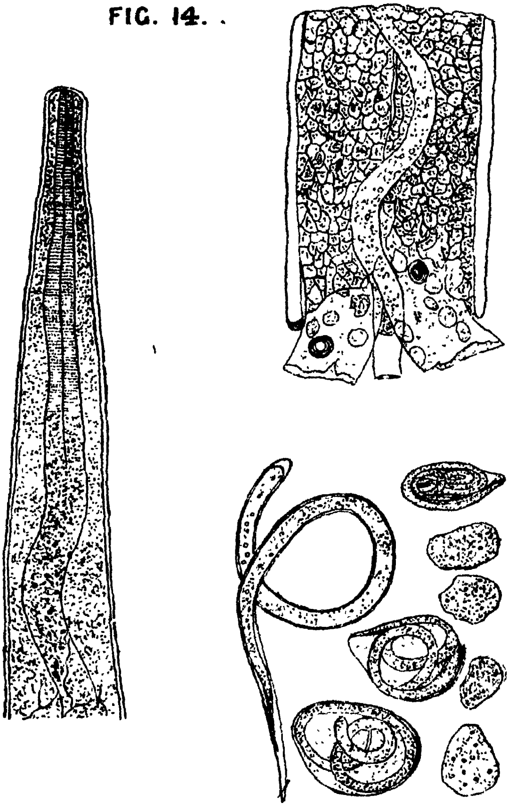
* Text Book of Physiology.

FIG. 14.



Filaria Sanguinis Hominis—after Lewis.*

Fig. 1.—Anterior extremity of the mature Filaria sanguinis hominis × 100.

Fig. 2.—A portion of the mature Filaria showing uterine tubules filled with ova in various stages of development; also the intestinal tube × 100.

Fig. 3.—Ova and embryos of the Filaria × 300.

Expectoration.—The basis of all kind of expectoration is the natural secretion of the mucous membrane of the air tubes, which is a transparent, colourless, glutinous liquid, consisting chiefly of water, mucus and saline matter. In simple catarrh, the natural secretion is merely increased in quantity; in bronchitis, the sputa is often glairy like white of egg and streaked with blood; in hæmoptysis, the expectoration for a short time may consist entirely of blood; in phthisis, purulent fluid and portions of softened tubercle are expectorated, occasionally with cretaceous or calcareous masses of phosphate and carbonate of lime; in pneumonia at the outset, there is merely expectoration of bronchial mucus, but in two or three days the sputa may assume a very characteristic appearance, being transparent, tawny or rust-coloured, and united into a jelly-like mass of great viscidity.

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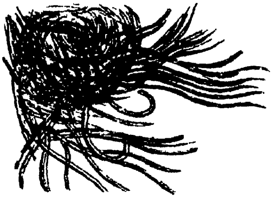
* Lancet, Vol. II, 1877, page 454.

FIG. 15.



Fragment of areolar and elastic tissue of the lung found in phthisical sputum; —after Bennett.

To examine the sputa microscopically they should be thrown into water, when the lighter portions will float on the surface, while the more dense sink. These latter can then be broken up, transferred to a staining solution of logwood* in a watch glass for a few minutes and then placed on a glass slide with a drop of water or salt solution for examination.

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* Note.—The staining solution may be made as follows:—

Logwood chips, 80 grains; water, 800 c.c. Soak for 24 hours and add ½ per. cent. alum solution, 1·400 c. c; spirit of wine, 120 c.c.—Filter.

The advantage of this fluid is due to the elective affinity the stain has for the nuclei of cells, which when stained are seen much more distinctly.

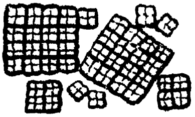
The matters usually found consist of epithelium, portions of food, muscular fibres, oil globules, fibres of various kinds, starch granules, and occasionally vegetable fungi which are often present about the fauces. To detect lung tissue, the plan of Dr. Fenwick may be followed: shake up the expectoration coughed up by the patient during twelve or twenty-four hours—from ten at night to ten the next morning being the best period—with an equal quantity of solution of caustic soda (20 grains to an ounce of water) and boil it in a glass beaker stirring it occasionally with a glass rod. As soon as it boils, it becomes liquid, then pour it into a conical glass and add four or five times the quantity of cold distilled water. If the mucus be still gelatinous the fluid is not boiled sufficiently, or enough caustic soda has not been added to it. The lung tissue if present, will sink to the bottom of the glass, forming a slight deposit in a quarter of an hour, and can readily be removed by a dipping tube, then stained in the logwood solution and examined with the microscope, the air cells will be detected very often, bronchial tubes of minute size, and bits of arteries may be seen.

Ehrlich's method of Staining Tubercle-Bacilli.—'The sputum is spread in a thin layer on a cover-glass, and dried. In order to fix the albumen the cover glasses are kept at a temperature of 212° to 230° F. for an hour; or in practice it is sufficient to pass them three or four times through a gas or spirit-lamp flame. The staining solution is prepared as follows:—About five cubic centimetres of pure aniline are added to 100 cubic centimetres of distilled water, well shaken, and then filtered through a moistened filter. To this mixture, a saturated alcoholic solution of fuchsine, methyl-violet, or gentian violet, is added till precipitation commences. The cover-glass is allowed to float on this, with the side on which the sputum has been spread directed downwards, for a quarter to half an hour. It is then washed for a few seconds in a strong solution of nitric acid (one part of commercial nitric acid to two parts of distilled water), and afterwards in distilled water. In this way, the stain is extracted from everything but the tubercle-bacilli. The ground substance may be stained brown (if the bacilli have been stained violet), or blue (if the bacilli have been stained red), by way of contrast to the bacilli. The examination of sputa after this method is employed in Berlin as a means of diagnosing tuberculous affections of the lungs, for the bacilli are constantly present in sputa in cases of tubercle*.

It is necessary to use the quarter inch object glass in examining for such objects.

Vomited matters.—The chief substances found are epithelium, starch granules, portions of undigested food, torulæ, and other varieties of vegetable fungi resembling the yeast plant, vibriones, and sarcinæ.

FIG. 16.



The *Sarcinæ Ventriculi,* a fungus first described by Goodsir, consists of square bundles, divided by vertical and horizontal lines into four parts, each having a resemblance to a woolpack, whence its name, they are seen either singly or aggregated into masses. These vegetable parasites are found in the vomit when it is very acid, and when it resembles yeast in appearance. Sarcinæ are chiefly found in connection with pyloric obstruction. They have also been found in the urine, fæces, and in the fluid of the ventricles of the brain.

In "Coffee-ground vomit," blood cells and altered hæmatin are found; "bilious" vomit contains epithelial cells, biliary colouring matter, and fat globules.

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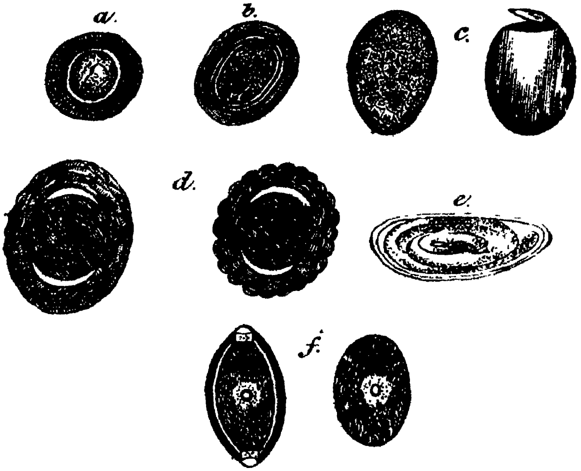
* *Brit. Med. Journal,* June 17, 1882.

Fœces.—It is occasionally necessary to wash the fæces in water and examine them for the ovæ of the different intestinal parasites, also for shreds of tissue from the mucous membrane in cases of ulceration.

FIG. 17.

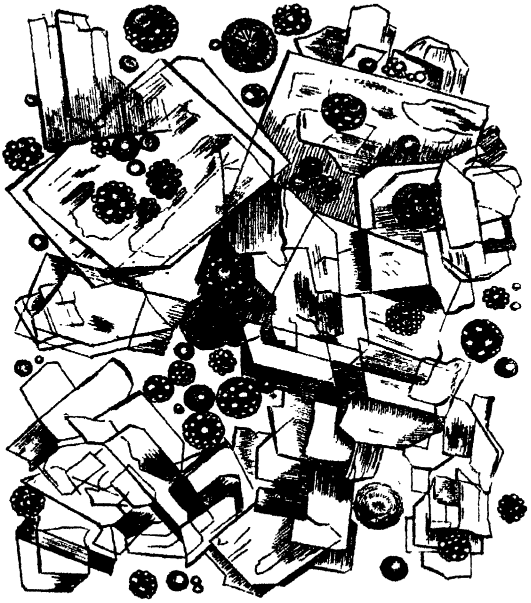


Ova of Worms.

(*a*) Ripe ova of Tenia Solium, (Leuckart).
(*b*) Ripe ova of T. Media-canulata, (Davaine).
(*c*) Ova of Bothriocephalus latus, empty and containing yolk, (Leuckart).
(*d*) Ova of the Ascaris Lumbricoides.
(*e*) Ova of Oxyuris Vermicularis, (Leuckart).
(*f*) Ova of Trichocephalus dispar, (Leuckart).

Urine.—Some plates of the different crystals and renal casts most commonly found in urine will be seen at pages 161 to 167, their significance and the methods of examina- are more fully described in the chapter on the subject.

FIG. 18.

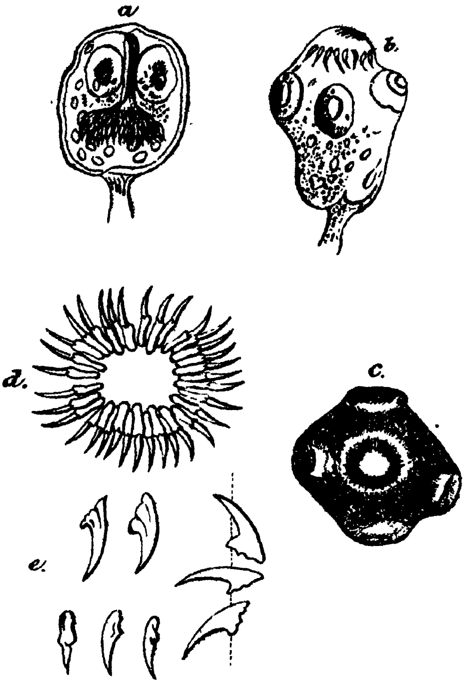


Crystals of Cholestrine.

Obtained from the fatty matter in casts separated from the urine of a case of fatty degeneration of the kidneys.—'BEALE' × 215.

Serous fluids.—These should all be allowed to stand for a time, that any solid matters may settle before examination. The bodies found in the contents of the serous cavities are mainly epithelial cells and granules. If there be inflammation we have more or less pus cells, shreds of fibrin, oil globules, spherical cells, cholesterine; in the fluid of hydatid cysts hooklets and heads of the ecchinococcus are found; in

FIG. 19.

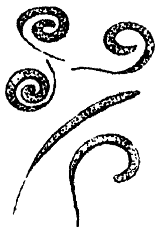


Ecchinococcus.

(*a*) With head retracted, (*b*) With head extruded.
(*c*) One viewed transversely the head being directed towards the observer.
(*d*) Circlet of hooks seen upon its under surface, thirty-four in number.
(*e*) Lateral views of the separate hooklets;—after Atkin.

that of hydrocele epithelial débris, spermatozoa occasionally (*vide page* 163), and cholesterine; in ovarian cysts, spherical, nucleated, or granular cells, granules, oil globules, and blood corpuscles will be found. In lymphatic cysts and in the fluid exuded from the "lymph scrotum" the *filaria sanguinis hominis* will be found, (*vide Fig.* 14.) In the fluid of the blister which forms over the place of exit of a Guineaworm numerous embryoes will be seen.

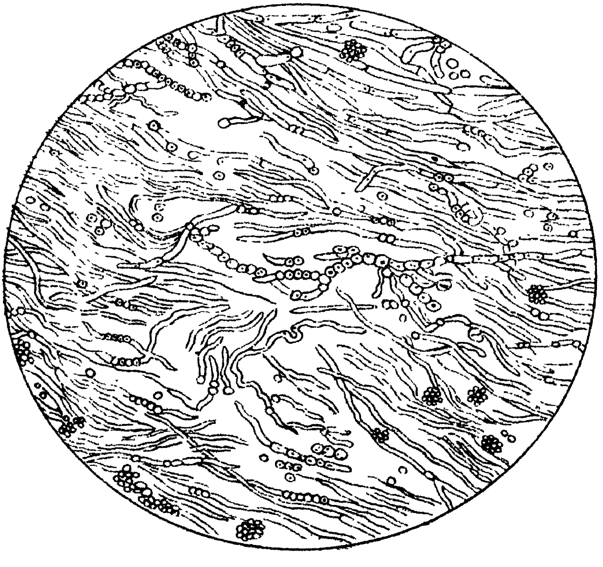
FIG. 20.



Young of Guineaworm more or less spirally curved ;— after Bastian.

Parasitic skin diseases.—A very slight scraping of the epithelial scales situated at the edge of a diseased patch, or an actually diseased hair should be placed at once in diluted liquor potassæ for examination.

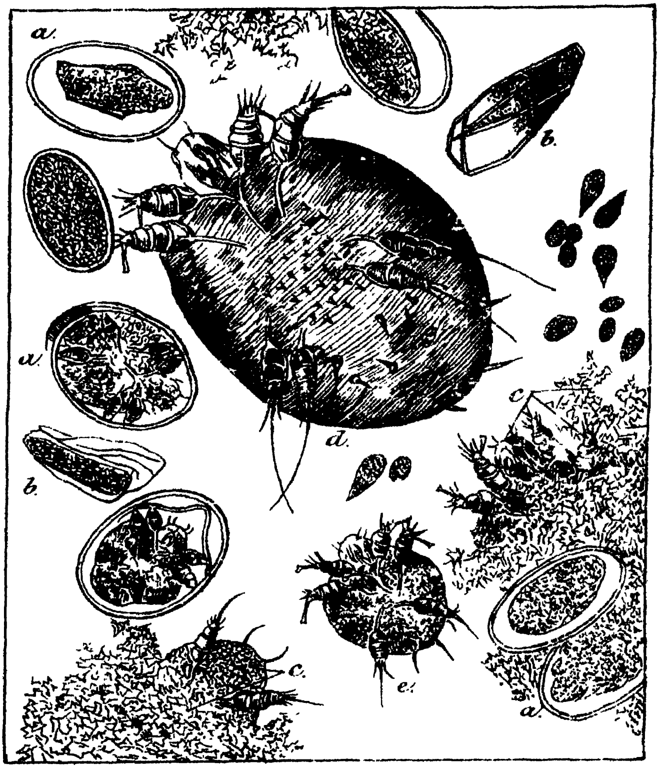
FIG. 21.



Ringworm. *Trichophyton Tousurans* ;—after Tilbury Fox.

In examining for the *acarus scabei*, the crusts should be selected; in the "furrow" the eggs will be found.

FIG. 22.



Crust from a case of Scabies and eggs of acarus in various stages of development. *b. b.* Egg Shells. *c. c.* Fragments of Acari. *d.* Female acarus. *e.* Male acarus. The little oval or irregular shaped masses are supposed to be excrement ;—after Tilbury Fox.

The ectozoa are not at all uncommon in this country amongst the lower classes. The following plates will give a good idea of their microscopic appearance.

FIG. 23.

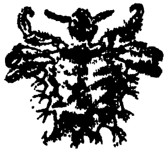


FIG. 24.

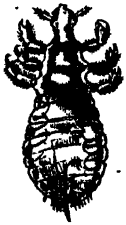
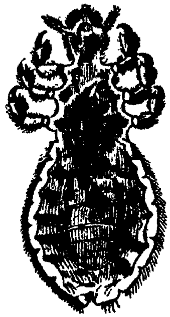


FIG. 25.

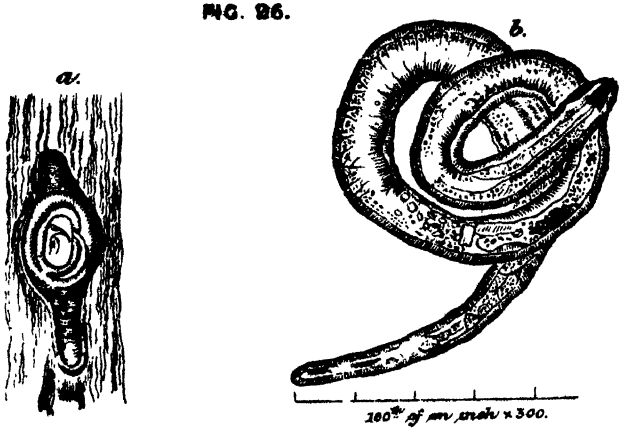


Ectozoa.

23. Phthirius inguinalis or crab louse.
24. Pediculus capitis or head louse.
25. Pediculus Vestimenti or body louse.

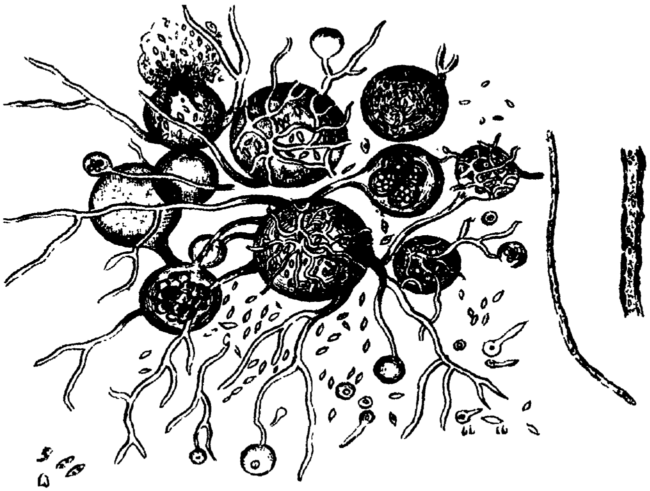
Amongst the entozoa found in man the *trichinæ spiralis* is found as a more or less transparent capsule lying between the sarcolemna of the primitive muscular fibres, but when the parasite is free it finds its way within the sheath. It is the cause of the *trichinotous* disease in animals and man.

FIG. 26.



a. within the capsule; *b*. capsule removed.

FIG. 27.



Fungus found in Madura Foot, Chionyphe Carteri, reduced half size from the original; — after Tilbury Fox.

This Fungus was first described by Surgeon-Major Carter of the Bombay Medical Service, as existing in the deep tissues, and bones of the hands and feet of persons suffering from Mycetoma or Madura Foot.

Much may be learnt by means of the microscope from the examination of portions of tumours, or from the examination of *post-mortem* specimens in their fresh state. The student cannot hope to do much at this kind of work until he has gone through a course of histology in the class for the study of the microscope, and is never likely to understand pathological changes until he has learnt the appearance of the healthy tissues.

Thin sections of recent tissues for examination under the microscope can be made in the *post-mortem* room, such tissues as the lungs cannot be cut without being either frozen or embedded in wax or some such material, but useful sections of the liver or kidney can be made with either a sharp razor, or a Valentin's knife.

The razor should be broad-bladed and hollow ground; the original 'army razor' is very good. It should always be stropped in one direction, and must be very sharp. In order to use it, hold the razor firmly in the right hand with the fingers closed above the handle, take the mass to be cut between the index finger and thumb of the left hand, support the back of the razor on the mass, and cut from left to right, and from the heel to the tip of the razor. The handle should be kept in a line with the blade. It requires much practice to make thin sections.

The blade should be kept well wetted with water, into which the cut specimens must be floated off with a camel's hair brush after each sweep of the razor.

The thinnest sections should be chosen, and placed for ten or twenty minutes in the logwood solution for staining, they may be then placed by means of a "section lifter" on a slide for examination, a little glycerine or salt solution added, and a covering glass applied.

Valentin's knife is sometimes used for cutting sections from fresh tissues. It consists of two blades, which can be separated to the desired distance by a screw. The section is cut between them by drawing the knife *rapidly* through the tissue, separating the blades, and floating it off into water.

Thin membranous structures may be examined by simply staining them, spreading them out in a drop of water placed upon a glass slide, and covering them with a thin glass. In the examination of tumours much may be learnt by gently scraping the freshly-cut-surface with a knife, staining the elements thus separated and examining them in glycerine.

Teazing is done by placing a *small piece* of the tissue in a drop of either glycerine or salt solution on a slide, and teazing it in the direction of its fibres with two strong needles mounted in handles. The tissue should be stained beforehand in the logwood solution.

A *section lifter** can be easily made by beating out flat one end of a thick copper wire, four or five inches in length · the flattened portion should be filed at the edges and rubbed smooth with sand-paper.

Normal *saline solution* is a ·75 per cent. solution o chloride of sodium.

---

* Manual for the Physiological Laboratory.—HARRIS and POWER.

PART V.

POISONS AND ANTIDOTES.

Poisons.	Antidotes.
Acid Carbolic ...	Castor-oil and sweet-oil mixed. Saccharated solution of lime, albumen, dilate sulphuric acid. Tea or coffee if there is narcotism.
Acid Hydrochloric ,, Nitric ... ,, Sulphuric ...	Chalk, magnesia, and emollient drinks, soap-suds, diluted solution of carbonate of soda, fixed oils. Magnesia preferable to chalk.
Acid Hydrocyanic, and (Cyanides).	Fresh air and *artificial respiration immediately*, with cold affusion, freshly precipitated oxide of iron with an alkaline carbonate; prepared thus, take ten grains of sulphate of iron, one drachm of tincture of iron, and one ounce of water, mix with twenty grains of carbonate of Potash dissolved in one ounce of water.
Acid Arsenious ...	Moist peroxide of iron,[*] emetics, ammonia artificial respiration, cold affusion, oil, or milk and lime-water.
,, Arsenic ...	A mixture of solution of green sulphate of iron with magnesia, animal charcoal.
Aconite	Emetics, stimulants external and internal, animal charcoal. [†]
Antimony Tartarised	Tannic acid, catechu, vegetable astringents, tincture or infusion of digitalis, alkalies and lead salts.
,, Sesquichloride *Butter of Antimony*	Same as mineral acids.
Atropia	Same as Belladonna.

---

[*] Keep a solution of Persulphate or Perchloride, and when oxide is required, add calcined magnesia till a thick paste results, and at once administer the mixture thus produced.—(*Chemical News.*) *Dose of Peroxide*, 2 to 4 drs. to be repeated until effective.

[†] About 4 drs. required for each grain of the Alkaloid.

Poisons.	Antidotes.
Acetate of lead ...	Same as Barium salts, succeeded by emetics and active purgatives, and afterwards by opium.
Barium Salts ...	Solution of sulphate of magnesia, soda, or alum.
Belladonna ...	An emetic of ten grains of sulphate of copper in two ounces of water; afterwards opium in proportion required to counteract effects of Belladonna, or morphia given hypodermically.
Calabar Bean ...	Emetics; Sulphate of Atropia gr. $\frac{1}{120}$ to $\frac{1}{60}$ by subcutaneous injection repeated every hour until pupils are fully dilated and pulse rate increased.
Cantharides ...	Emetics, emollient drinks, opiates by mouth and rectum.
Chloride of Lime...	Emetics, white of egg, milk, flour; *not* acids.
Chlorine Gas ...	Inhale steamed air containing a little ammonia. Fresh air.
Chlorine Water ...	Same as chloride of Lime.
Chloroform ...	Fresh pure air and artificial respiration. Incline body, head down, at angle of 40°. Administer a few drops of nitrite of amyl in vapour. Galvanism to spine and epigastrium.
Colchicum ...	Emetics followed by demulcent drinks, and if coma be present brandy, ammonia, coffee, and other powerful stimulants.
Conium ... ... (*Hemlock.*)	Emetics, followed by stimulants external and internal, artificial respiration long continued.
Croton Oil ...	An emetic of Sulphate of copper ten grains in solution at once, followed by mucilaginous fluids, and opium to check diarrhœa.
Copper, Sulphate of.	Eggs, milk, wheat flour, water; *Ferrum redactum* or iron filings.

Poisons.	Antidotes.
Digitalis	In case of over dose *recumbent posture most important ;* after stomach has been emptied, ten grains of tannic or gallic acid in hot water repeated frequently; stimulants externally and internally.
Elaterium	Emollient and demulcent drinks and enemata, followed by small but repeated doses of opium, and the use of the warm bath.
Hyoscyamus	Stomach pump, emetics, external and internal stimulants, lemon juice.
Indian Hemp	In case of overdose, an emetic, hot brandy and water, and allow patient to sleep.
Iron, Carbonate of.	An emetic of sulphate of copper ten grains to four ounces of water.
Iodine	Emetics aided by demulcent drinks, starch or flour diffused in water, boiled potatoes, bread.
Lead Salts	Same as Barium Salts. See acetate of lead.
Lobelia	The most active stimulants externally and internally.
Mercury, Perchloride of	Albumen: *white of egg* in moderate quantity lest excess of it should redissolve compound; four grains require the white of one egg, the yolk is equally effective, wheat flour, milk.
Morphia	*See opium.* Animal charcoal.
Nitrate of Silver	The best is solution of common salt or sea water. White or yolk of egg and wheat flour are useful.
Nux Vomica	*Tobacco* in infusion or enema (½ oz. to 20 oz. of boiling water) may be given till spasms abate. Chloral in large doses. Nicotine, if at hand, dose one drop in warm sherry and water. —Professor Haughton.

Poisons.	Antidotes.
Opium	Emetic of ten grains of sulphate of copper, stomach pump, external stimulants, cold affusion, ammonia to nostrils, compelled exertion and artificial respiration. Tincture of Belladonna ten minims every $\frac{1}{2}$ hour; atropine hypodermically $\frac{1}{120}$ grain at first, and repeated every hour till pupil dilates.
Phosphorus	Oil of turpentine thirty minims every quarter of an hour in mucilage.
Potash	Dilute acetic acid, citric acid, lemon juice, any vegetable acid, fixed oils, demulcents, sour beer.
Soda	*Idem.*
Stramonium (Datoora)	Same as Belladonna.
Strychnia	Chloroform, Chloral, Belladonna, tincture of Aconite, Tobacco (Prof. Haughton). Tannic acid. *Lancet,* 1863). Iodine (Dr. Fuller). Animal charcoal.
Tobacco	Strychnia (Prof. Haughton). An emetic, stimulants externally and internally.
Tin	Same as Mineral Acids.
Zinc Salts (*Burnett's Solu.*)	Warm demulcent drinks, as linseed tea, barley water; emetics; and same as mineral acids; if inflammation follow, antiphlogistics.

Bites of venomous snakes or vipers.—Fayrer recommends the application of a ligature as tightly as possible on the limb above the seat of the wound, scarification and suction by means of the mouth (there is no fear of poisoning if there is no abrasion in the mouth) or cupping glass, and subsequently the application of the actual cautery, or cauterization with caustic potash or a mineral acid. If the limb swell after the application of a ligature, this must then be loosened to be drawn tight again whenever symptoms of general infection show themselves. If a finger or toe form the seat of the bite, it is then best to amputate the limb at the joint next above the wound. If the bite has been inflicted at a point which does not admit of the application of a ligature, the indication then is to promptly excise the injured tissue, together with the surrounding parts.

The patient should rest perfectly quiet. As soon as indications of poisoning are perceived, preparations of ammonia (liquor ammoniæ) are to be administered, or, what is still better, he should be made to drink copiously and frequently of spirituous liquors diluted with hot water, taking care, however, not to produce intoxication. Should symptoms of collapse supervene, sinapisms, galvanization of the heart and diaphragm, or cold douches may be resorted to.* It is always necessary to find out whether the snake or viper was a poisonous one, if so, to remember that it may not have been in an active state, its poison may have been feeble, or may not have been injected in any quantity into the wound.

The use of liquor potassæ has again been strongly recommended by Deputy Surgeon General Shortt; the permanganate of potash has been brought forward as of use, especially when it can be brought locally into contact with the poison in the tissues in a ten per cent. injection.

On washing out the stomach.—Should the stomach pump be out of order, the following directions of Professor Esmarch† will be of use, 'get, if you can, a piece of gutta-percha tubing an inch in circumference, and, if the patient is not unconcious, make him swallow twenty to twenty-five inches of it, enough to reach the stomach; raise the free end above his head, and by means of a funnel, pour as much water down as the stomach will receive, then lower the free end below the level of the stomach and the stomach will empty itself. Repeat the process several times.'

A Toxicological Chart compiled by Dr. W. Stowe has been published by Messrs. Joll of New Burlington St., London. It gives fully the symptoms, treatment, tests of all poisons mineral, vegetable, and animal; also hints on the treatment of suspended animation from different causes. It should be hung in the dispensary of all hospitals.

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* *Von Ziemssen's Cyclopœdia*, Vol. III., page 548.

† First aid to the injured, 1882.

APPENDIX.

SPONGE GRAFTING.

TAKE a piece of good Turkey sponge and soak it for two days in dilute hydrochloric acid (1 to 4), wash off the superfluous acid in carbolic lotion (1 to 20), soak the sponge in carbolic oil (1 to 10) for twenty-four hours, shake it up well in carbolic lotion (1 to 10) to remove as much of the oil as possible; keep it for use in carbolic lotion (1 to 20).

I have found the above method succeed and have used sponge grafting with considerable success in indolent ulcers, they appeared to cicatrize more rapidly than with skin grafting. The dressing was applied in the following manner, the ulcer was well washed with carbolic lotion (1 to 20), small portions of the prepared sponge were cut and applied to its surface, over these small pieces of Lister's protective wet with carbolic lotion were placed, (I imagine guttapercha tissue treated in the same way would do as well); a fourfold pad of boracic lint was then bandaged on over all, and the ulcer dressed daily. If the ulcer was treated in the same manner and dressed according to Lister's aseptic method, the dressing would not require to be changed so often.

MR. BARWELL'S METHOD OF PREPARING CARBOLISED CATGUT LIGATURES FROM THE AORTA OF AN OX.

The outer cellular coat should be peeled off the aorta of a recently killed ox; then, with a scissors, cut the middle and inner coat spirally round, taking care to keep the breadth equable. The elasticity is eliminated by suspending the cord and hanging to it a weight of from two to four pounds according to thickness. Thus treated the ribbon dries in about six hours into a horny or vellum-like substance; any previously neglected irregularities may be scraped off with a sharp penknife; then the cord may be stored in antiseptic gauze until wanted. About fifteen or twenty minutes before the operator is ready to pass the needle, a sufficient piece of the material is to be soaked in a three per cent. solution of carbolic acid, when it will become quite soft and easy to tie.[*]

Area of Absolute Cardiac Dullness.

The following is Dr. Latham's rule for the definition of the part of the precordial region which is less resonant on percussion. "Make a circle of two inches in diameter round a point midway between the nipple and the end of the sternum. This circle will define, sufficiently for all practical purposes, that part of the heart which lies immediately behind the wall of the chest, and is not covered by lung or pleura."

Position of the Valves of the Heart.

The aortic valves lie behind the junction of the third costal cartilage, on the left side of the sternum.

The pulmonary valves lie in front of the aortic behind the junction of the third left costal cartilage with the sternum.

The tri-cuspid valves lie behind the middle of the sternum, about the level of the fourth costal cartilage. The mitral valves (the deepest of all) lie behind the third intercostal space, about one inch to the left of the sternum.

Thus these valves are so situated that the mouth of an ordinary sized stethescope will cover a portion of them all, if placed over the sternal end of the third intercostal space, on the left side. All are covered by a thin layer of lung ; therefore we hear their action better when the breathing is for a moment suspended.[†]

Viscera situated in the different regions of the Abdomen.

Quain's Anatomy, 8th Edition, Vol. II, p. 347.

Epigastric region.	The right part of the stomach, the pancreas, and part of the liver.
Hypochondriac, right...	The right lobe of the liver, with the gall bladder, part of the duodenum, the hepatic flexure of the colon, part of the right kidney with the corresponding supra-renal capsule.

---

[*] *Mr. Thompson's paper in the B. M. J., Oct. 14th* 1882, *page* 727.

[†] *Holden's Landmarks—Medical and Surgical,* 1881, *page* 28.

Hypochondriac, left.	The large end of the stomach, with the spleen, and narrow extremity of the pancreas, the splenic flexure of the colon and the upper part of the left kidney with the left supra-renal capsule. Sometimes also a part of the left lobe of the liver.
Umbilical ...	Part of the omentum and mesentory, the transverse part of the colon, lower part of the duodenum, with some convolutions of the jejunum and ileum. Division of aorta one inch and a half below umbilicus. A more reliable guide to this division than the umbilicus, is a point a very little to the left of the middle line about the level of the highest part of the crest of the ilium.
Lumbar, right...	The ascending colon, lower half of the kidney, and part of the duodenum and jejunum.
Lumbar, left ...	The descending colon and lower part of the left kidney, with great part of the jejunum.
Hypogastric ...	The convolutions of the ileum, the bladder in children, and if distended in adults also; the uterus when in the gravid state.
Iliac, right ...	The cœcum, with the appendix vermiformis, and the termination of the ileum.
Iliac, left ...	The sigmoid flexure of the colon.

Vide Fig. 1, *page* 70.

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